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THE MARINE OBSERVER

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Letters to the Editor, and books for review, should be sent to the Editor, 'The Marine Observer', Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

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Excellent Awards, 1975

The process for selecting annual Excellent Awards has been modified this year. Instead of three Awards going to a particular ship, i.e. to the Master, Principal Observing Officer and Radio Officer, they are now being made to individuals. Therefore two or more Masters, Principal Observing Officers or Radio Officers from the same ship may each receive an Award. In some cases Masters and Principal Observing Officers have been given Awards where the Radio Officer has not, and alternatively, in others, Radio Officers have been the only officers to receive the Award. Prior to 1975, following the practice established in 1924, three Awards were presented to the best 100 ships but now, with more frequent crew changes during a period of twelve months, a ship may have several Masters, Principal Observing Officers and Radio Officers and, if we continued the old system, difficulties could be experienced in deciding which Master or Officer should receive the Award. In some cases the observation side of the meteorological logbook fully qualified for excellent marking whereas the radio transmissions did not fully meet the requirements. In other cases the radio transmissions could not be faulted, but the observations themselves failed to quite make the standard. In each of these cases the higher mark on one side helped to make the aggregate mark required for an Excellent Award. We therefore consider that it is fairer to all concerned to assess the two sides of the work separately.

The method of assessing the logbooks is virtually the same as it always has been and the total number of books awarded also remains the same. Consideration has been made for the type of vessel, her trade pattern, number of observing officers and whether the ship has a high- or low-powered transmitter etc. Marks given for ocean-current data are allocated for the type of observation as much as for the quantity received. Allowances are also made for the method of determining the fixes; obviously more effort is required to work up five or six star sights to obtain a position than by using Satellite Navigator or other electronic position-finding systems.

May we congratulate the Masters and Officers who have gained the Awards and, once again, commiserate with the very many others who have almost, but not quite, reached the required degree of excellence. The list for 1975 appears on pages 95–100 of this issue.

A 'short list' of 6 ships gaining the highest marks, by joint effort of observational and radio work, reads as follows:

1. *Antilochus* (Ocean Transport & Trading Ltd.), Captain A. J. Palmer.
2. *Mayfield* (Shaw Savill & Albion Co. Ltd.), Captain J. Ferres.
3. *Summity* (F. T. Everard & Sons Ltd.), Captain W. G. Hunt.
4. *Kowloon Bay* (Ocean Transport & Trading Ltd.), Captain D. T. MacLachlan.
5. *Illyric* (Shaw Savill & Albion Co. Ltd.), Captain H. Nixon.
6. *Ross Orion* (British United Trawlers Ltd.), Skipper A. Osler.

Photographs of the first three ships are shown opposite page 108.

Special congratulations are due to three of the above ships. *Summity* and *Kowloon Bay* are appearing for the second time on the short list and *Ross Orion* has the distinction of appearing for the fourth time, no mean achievement considering that there are approximately 550 ships from which to choose.

The Awards to Trawler Skippers and Radio Officers who make non-instrumental observations, together with the Awards made to Marid ships (vessels employed on short sea trades which take sea temperatures only, though wind and weather are also recorded when reporting in the North Sea), are shown on pages 99–100. Their contribution to the Meteorological Office is extremely important.

EXCELLENT AWARDS (Year ended 31 December 1975)

Captain	Company
E. F. H. Allen	P. & O. S.N. Co
I. R. Ansell	Ben Line Steamers Ltd.
A. H. Aston	P. & O. S.N. Co.
I. R. Atkinson	Ocean Transport & Trading Ltd.
A. Ball	T. Hamling & Co. Ltd.
J. Banna	Ocean Transport & Trading Ltd.
I. Y. Batley	P. & O. S.N. Co.
P. St. Q. Beadon	Union-Castle Mail S.S. Co. Ltd.
D. M. Belk	Ocean Transport & Trading Ltd.
W. E. Bellamy	Ocean Transport & Trading Ltd.
J. Bentley	Ocean Transport & Trading Ltd.
J. K. Blackburn	Container Fleets Ltd.
A. T. Blenkin	T. Hamling & Co. Ltd.
J. M. Brackenridge	Cayzer Irvine & Co. Ltd.
P. J. Broomfield, R.D.	Ocean Transport & Trading Ltd.
R. Brownbill	Associated Container Transportation Ltd.
A. Burnett	Ben Line Steamers Ltd.
M. J. Butler	Bibby Line Ltd.
J. B. Caley	Clan Line Steamers Ltd.
M. Champneys	P. & O. S.N. Co.
M. J. Charlesworth	P. & O. S.N. Co.
A. J. Chivers	Blue Star Line Ltd.
J. E. Conram	Hudson Bros. Trawlers Ltd.
N. W. Cockshoot	Manchester Liners Ltd.
N. F. Wray-Cook	Clan Line Steamers Ltd.
J. Cosker	P. & O. S.N. Co.
R. I. Crawford	Sir Wm. Reardon Smith & Sons Ltd.
R. R. Crump	Panocean Shipping & Terminals Ltd.
M. de Lacy	United Baltic Co. Ltd.
D. L. des Landes	Associated Container Transportation Ltd.
D. C. Dalton	B.P. Tanker Co. Ltd.
A. J. Fenwick	Cable & Wireless Ltd.
J. Ferres	Shaw Savill & Albion Co. Ltd.
C. M. Gibbs	P. & O. S.N. Co.
T. R. Halliday	Clan Line Steamers Ltd.
D. V. Harradine	P. & O. S.N. Co.

Captain	Company
A. D. Hay	Ben Line Steamers Ltd.
D. Hine	Bibby Line Ltd.
D. J. Houghton	Furness Withy & Co. Ltd.
S. T. S. Household	P. & O. S.N. Co.
W. S. Howcroft	P. & O. S.N. Co.
G. L. Howe, O.B.E.	Natural Environment Research Council
L. E. Howell	Container Fleets Ltd.
W. G. Hunt	F. T. Everard & Sons Ltd.
P. W. Hunt	Blue Star Line Ltd.
S. J. E. Hunter	Clan Line Steamers Ltd.
E. J. Johnson	T. Hamling & Co. Ltd.
W. A. E. Johnston	Furness Withy & Co. Ltd.
A. W. Jones	P. & O. S.N. Co.
N. A. Joyce	Ocean Transport & Trading Ltd.
W. R. Kays	Bristol S.N. Co. Ltd.
B. M. Ketchen	Ocean Transport & Trading Ltd.
F. G. King	Cayzer Irvine & Co. Ltd.
J. M. Laing	Currie Line Ltd.
S. J. Lawrence	British Antarctic Survey
P. Lay	P. & O. S.N. Co.
J. C. Liptrot	Ocean Transport & Trading Ltd.
R. C. Lister	P. & O. S.N. Co.
I. G. Lumley	Ellerman Lines Ltd.
R. W. Lumsden	Shell Tankers (U.K.) Ltd.
D. Macdonald	J. & J. Denholm Ltd.
C. S. Mackinnon	Ocean Transport & Trading Ltd.
D. T. MacLachlan	Ocean Transport & Trading Ltd.
C. Maclean	Lyle Shipping Co. Ltd.
J. A. Macleod	Ellerman Lines Ltd.
I. B. McNaughton	B.P. Tanker Co. Ltd.
C. R. S. Monk	P. & O. S.N. Co.
R. Moore	Ocean Transport & Trading Ltd.
H. Nixon	Shaw Savill & Albion Co. Ltd.
A. Osler	Hudson Bros. Trawlers Ltd.
A. J. Palmer	Ocean Transport & Trading Ltd.
T. R. Parsons	Clan Line Steamers Ltd.

Excellent Awards (*contd.*)

Captain	Company
R. J. Paterson	Ocean Transport & Trading Ltd.
E. M. S. Phelps	British Antarctic Survey
J. Porteus	Sir Wm. Reardon Smith & Sons Ltd.
J. R. Rodger	Ben Line Steamers Ltd.
K. W. Rourke	Manchester Liners Ltd.
A. A. Rundle	Ocean Transport & Trading Ltd.
M. R. Ryan, O.B.E.	Container Fleets Ltd.
T. Sawyers	T. Hamling & Co. Ltd.
F. Shepherd	Manchester Liners Ltd.
A. N. Smith	B.P. Tanker Co. Ltd.
W. C. S. Spencer	Ben Line Steamers Ltd.
D. H. Stewart, R.D.	Ocean Transport & Trading Ltd.
A. D. Terras	Clan Line Steamers Ltd.
J. D. Thomson	Container Fleets Ltd.
J. S. Thorpe	Container Fleets Ltd.
R. Towell	B.P. Tanker Co. Ltd.
A. Ward	Newington Trawlers Ltd.
T. G. S. Ward	Port Line Ltd.
W. M. Wheatley	Shaw Savill & Albion Co. Ltd.
P. L. Whitehouse	F. T. Everard & Sons Ltd.
M. D. Whiteley	Clan Line Steamers Ltd.
R. J. Williams	Shell Tankers (U.K.) Ltd.
C. E. Willoughby	P. & O. S.N. Co.
R. A. Wilson	Container Fleets Ltd.
J. P. Wishart	Ocean Transport & Trading Ltd.
A. Woodcock	B.P. Tanker Co. Ltd.
E. R. Wooldridge	Newington Trawlers Ltd.
A. Yuill	Ben Line Steamers Ltd.

Principal Observing Officer	Company
N. Aldridge	Furness Withy & Co. Ltd.
W. R. Austin	Natural Environment Research Council
A. P. Baker	P. & O. S.N. Co.
R. S. Basford	Ben Line Steamers Ltd.
N. J. Blacker	P. & O. S.N. Co.
A. J. Blackler	Clan Line Steamers Ltd.
G. J. Blamey	B.P. Tanker Co. Ltd.
I. R. Boulton	Bristol S.N. Co. Ltd.
M. Bregazzi	Ocean Transport & Trading Ltd.
P. R. D. Brewer	Ocean Transport & Trading Ltd.
R. A. Brindle	Associated Container Transportation Ltd.
M. H. Burbridge	Ben Line Steamers Ltd.
R. D. Lorraine	P. & O. S.N. Co.
A. MacIntyre	F. T. Everard & Sons Ltd.
J. G. MacKay	P. & O. S.N. Co.
R. M. Maclure	Ocean Transport & Trading Ltd.
J. McKechnie	Shaw Savill & Albion Co. Ltd.
D. H. Makin	Bibby Line Ltd.
W. Marr	Cable & Wireless Ltd.
S. R. Mathews	P. & O. S.N. Co.
H. F. Monckton	British Antarctic Survey
C. B. Moon	Clan Line Steamers Ltd.
R. T. Murphy	T. Hamling & Co. Ltd.
K. O'Neill	Newington Trawlers Ltd.

D. H. Campbell	Currie Line Ltd.
T. W. Charlesworth	Shell Tankers (U.K.) Ltd.
A. W. Christie	P. & O. S.N. Co.
J. S. Chubb	Ocean Transport & Trading Ltd.
C. J. A. Cladingbowl	Ben Line Steamers Ltd.
D. Daniel	P. & O. S.N. Co.
A. Dewar	United Baltic Co. Ltd.
J. G. W. Dixon	Ocean Transport & Trading Ltd.
J. F. Dobson	Lyle Shipping Co. Ltd.
I. M. Dunkley	Associated Container Transportation Ltd.
T. W. Edmunds	Clan Line Steamers Ltd.
R. M. Ellismoor	Ocean Transport & Trading Ltd.
A. A. Field	Sir Wm. Reardon Smith & Sons Ltd.
L. J. Fletcher	Container Fleets Ltd.
J. P. Garner	Ocean Transport & Trading Ltd.
M. A. Gough	B.P. Tanker Co. Ltd.
M. L. Grover	Manchester Liners Ltd.
B. M. N. Hamzah	Ocean Transport & Trading Ltd.
K. S. Hardy	Ocean Transport & Trading Ltd.
D. J. Harris	Clan Line Steamers Ltd.
W. F. Harris	P. & O. S.N. Co.
B. A. Harrison	B.P. Tanker Co. Ltd.
M. S. Hartfield	P. & O. S.N. Co.
R. G. Head	Union-Castle Mail S.S. Co. Ltd.
P. J. M. Hickmutt	Clan Line Steamers Ltd.
R. Hill	Blue Star Line Ltd.
B. Hollywood	F. T. Everard & Sons Ltd.
S. T. Houldsworth	Ocean Transport & Trading Ltd.
M. D. Nasir Bin Ismail	Ocean Transport & Trading Ltd.
A. Jackson	B.P. Tanker Co. Ltd.
P. Johnson	Ocean Transport & Trading Ltd.
K. V. Jolly	P. & O. S.N. Co.
Datta Anup Kumar	Ocean Transport & Trading Ltd.
R. R. N. Laing	Hudson Bros. Trawlers Ltd.
D. S. Lever	Manchester Liners Ltd.
I. R. Lewis	Port Line Ltd.
R. J. Lewis	Cayzer Irvine & Co. Ltd.
R. P. Lonsdale	P. & O. S.N. Co.
W. O'Neill	Newington Trawlers Ltd.
D. K. Oosterhuis	Ocean Transport & Trading Ltd.
J. Othman	Ocean Transport & Trading Ltd.
R. G. Outram	Ocean Transport & Trading Ltd.
H. G. Pask	T. Hamling & Co. Ltd.
M. Pellett	P. & O. S.N. Co.
H. W. Perry	P. & O. S.N. Co.
M. C. Piercy	Manchester Liners Ltd.
J. F. Pink	Clan Line Steamers Ltd.
S. B. Rahman	P. & O. S.N. Co.
D. A. Raynor	J. & J. Denholm Ltd.
P. C. Roberts	Sir Wm. Reardon Smith & Sons Ltd.
M. J. Rudd	Shaw Savill & Albion Co. Ltd.
M. Rudrakumar	Ocean Transport & Trading Ltd.
A. L. Selmar	Panocean Shipping & Terminals Ltd.
M. R. Selvarajah	Ocean Transport & Trading Ltd.
M. L. Shakesby	British Antarctic Survey
R. Sharmon	B.P. Tanker Co. Ltd.
A. C. Skilton	Ben Line Steamers Ltd.
W. Sinclair	Ben Line Steamers Ltd.
R. I. Smart	Ocean Transport & Trading Ltd.
P. J. Sizer	Container Fleets Ltd.
R. J. Smith	Blue Star Line Ltd.
S. D. Smith	Container Fleets Ltd.
J. H. E. Spurgeon	Shaw Savill & Albion Co. Ltd.
K. C. Stone	T. Hamling & Co. Ltd.
A. V. Thomson	Ben Line Steamers Ltd.
C. E. Walford	Bibby Line Ltd.
R. L. Walker	B.P. Tanker Co. Ltd.
A. M. Walsh	Ocean Transport & Trading Ltd.
C. Watkins	T. Hamling & Co. Ltd.
M. J. Weston	Clan Line Steamers Ltd.
R. G. Wickham	Ellerman Lines Ltd.
R. N. E. Wilby	Shell Tankers (U.K.) Ltd.
D. Wilson	Container Fleets Ltd.
R. M. Wood	P. & O. S.N. Co.
C. C. Woodward	Container Fleets Ltd.
D. J. Worthington	Ellerman Lines Ltd.

Excellent Awards (*contd.*)

Radio Officer	Company
D. W. Abbey	Cayzer Irvine & Co. Ltd.
D. J. Atkinson	Southern Ferries Ltd.
K. Bent	Ocean Transport & Trading Ltd.
H. Benson	B.P. Tanker Co. Ltd.
S. J. Braithwaite	Container Fleets Ltd.
J. Breen	Marconi International Marine Co. Ltd.
H. E. Brookfield	Marconi International Marine Co. Ltd.
D. L. Byne	P. & O. S.N. Co.
J. B. Carr	Ocean Transport & Trading Ltd.
R. D. Cause	Ocean Transport & Trading Ltd.
D. Caws	International Marine Radio Co. Ltd.
I. Conn	Bibby Line Ltd.
R. Conway	Marconi International Marine Co. Ltd.
P. T. Cook	Ocean Transport & Trading Ltd.
A. J. L. Cottle	Sir Wm. Reardon Smith & Sons Ltd.
P. A. Cross	Bibby Line Ltd.
J. J. Daly	Marconi International Marine Co. Ltd.
M. Delaney	B.P. Tanker Co. Ltd.
T. D. Drummond	Marconi International Marine Co. Ltd.
D. C. Elsey	Marconi International Marine Co. Ltd.
J. Evans	P. & O. S.N. Co.
F. D. Farthing	Marconi International Marine Co. Ltd.
J. N. Shirley-Fox	Ocean Transport & Trading Ltd.
M. Gamble	Shell Tankers (U.K.) Ltd.
C. Gamwell	P. & O. S.N. Co.
D. G. Gunning	Ocean Transport & Trading Ltd.
J. Guthrie	Radio & Electronic Services
R. I. Hammerton	International Marine Radio Co. Ltd.
A. W. Hay	Ocean Transport & Trading Ltd.
R. G. Heath	P. & O. S.N. Co.
A. E. Holman	Ocean Transport & Trading Ltd.
B. Holness	Marconi International Marine Co. Ltd.
W. H. Huer	Marconi International Marine Co. Ltd.
A. G. H. McPhail	Shell Tankers (U.K.) Ltd.
J. Malinowsk	P. & O. S.N. Co.
T. J. Martel	Clan Line Steamers Ltd.
A. Mealia	Bibby Line Ltd.
J. Meskell	Marconi International Marine Co. Ltd.
E. E. Milburn	Ocean Transport & Trading Ltd.
D. Miller	Ocean Transport & Trading Ltd.
H. A. Mitchell	Clan Line Steamers Ltd.
P. M. J. Money	Cable & Wireless Ltd.
J. M. Muirhead	B.P. Tanker Co. Ltd.
B. A. Mullan	P. & O. S.N. Co.
P. T. Murphy	Marconi International Marine Co. Ltd.
R. T. Murphy	T. Hamling & Co. Ltd.
H. M. O'Gorman	British Antarctic Survey
S. O'Keefe*	Bristol S.N. Co. Ltd.
K. O'Neill	Marconi International Marine Co. Ltd.
W. O'Neill	Marconi International Marine Co. Ltd.
D. Owen	Associated Container Transportation Ltd.
M. R. Palmer	Ocean Transport & Trading Ltd.
J. R. Parry	Clan Line Steamers Ltd.
H. G. Pask	T. Hamling & Co. Ltd.
F. Paterson	Ellerman Lines Ltd.
R. J. Preece	Sir Wm. Reardon Smith & Sons Ltd.
R. Price	Marconi International Marine Co. Ltd.
R. B. Readhead	Container Fleets Ltd.
D. Ritchie	P. & O. S.N. Co.
P. J. Rogers*	F. T. Everard & Sons Ltd.
A. J. Rose	P. & O. S.N. Co.
D. K. Sanger	Marconi International Marine Co. Ltd.
I. J. Sarjeant*	F. T. Everard & Sons Ltd.
A. C. Sawyer	Cayzer Irvine & Co. Ltd.
F. F. A. Sharples	P. & O. S.N. Co.
D. A. Skarstein	Clan Line Steamers Ltd.

C. E. Hughes	Container Fleets Ltd.
D. A. Hunt	P. & O. S.N. Co.
N. G. L. Johns	Container Fleets Ltd.
C. L. Keeble	Marconi International Marine Co. Ltd.
P. J. Kilbane	Marconi International Marine Co. Ltd.
H. N. Kinley	Ocean Transport & Trading Ltd.
R. A. Knight	Ocean Transport & Trading Ltd.
G. Kraus	P. & O. S.N. Co.
R. A. E. Laing	B.P. Tanker Co. Ltd.
R. R. N. Laing	Marconi International Marine Co. Ltd.
W. J. Lloyd	Ocean Transport & Trading Ltd.
S. L. Ludgate	P. & O. S.N. Co.
K. D. MacBrayne	P. & O. S.N. Co.
W. Macleod	Shell Tankers (U.K.) Ltd.
P. J. McGill	Ellerman Lines Ltd.
M. S. McLaren	Ocean Transport & Trading Ltd.
C. McLusky	Ocean Transport & Trading Ltd.
K. C. Stone	T. Hamling & Co. Ltd.
D. P. Stoker	Ocean Transport & Trading Ltd.
J. Thompson	Marconi International Marine Co. Ltd.
A. G. Thomson	Ocean Transport & Trading Ltd.
A. E. Titley	P. & O. S.N. Co.
P. Twambley	Marconi International Marine Co. Ltd.
S. J. Tyler	Panocean Shipping & Terminals Ltd.
R. Wade	British Antarctic Survey
R. A. Wakeley	Ocean Transport & Trading Co. Ltd.
C. Watkins	T. Hamling & Co. Ltd.
J. Watson	B.P. Tanker Co. Ltd.
S. R. Wheeldon	Radio & Electronic Services
P. A. Whyley	P. & O. S.N. Co.
R. Willcocks	P. & O. S.N. Co.
F. Wilson	Marconi International Marine Co. Ltd.
D. Withers	Clan Line Steamers Ltd.
W. S. Young	Ocean Transport & Trading Ltd.

'MARID' SHIPS†

Captain	Principal Observing Officer	Radio Officer	Owner/Manager
D. C. Gray	R. H. R. Moar	W. Hodge	North of Scotland, Orkney & Shetland Shipping Co. Ltd.
M. Grigor	J. Carter	F. Messenger	British Rail
A. MacQueen	M. MacLeod	J. S. Mathers	Caledonian MacBrayne Ltd.
W. H. Conway	W. J. Frampton	L. R. Cathie	Normandy Ferries

* Deck Officer. † Vessels recruited for the purposes of observing and transmitting sea temperatures together with non-instrumental observations when in the North Sea.

Excellent Awards (*contd.*)

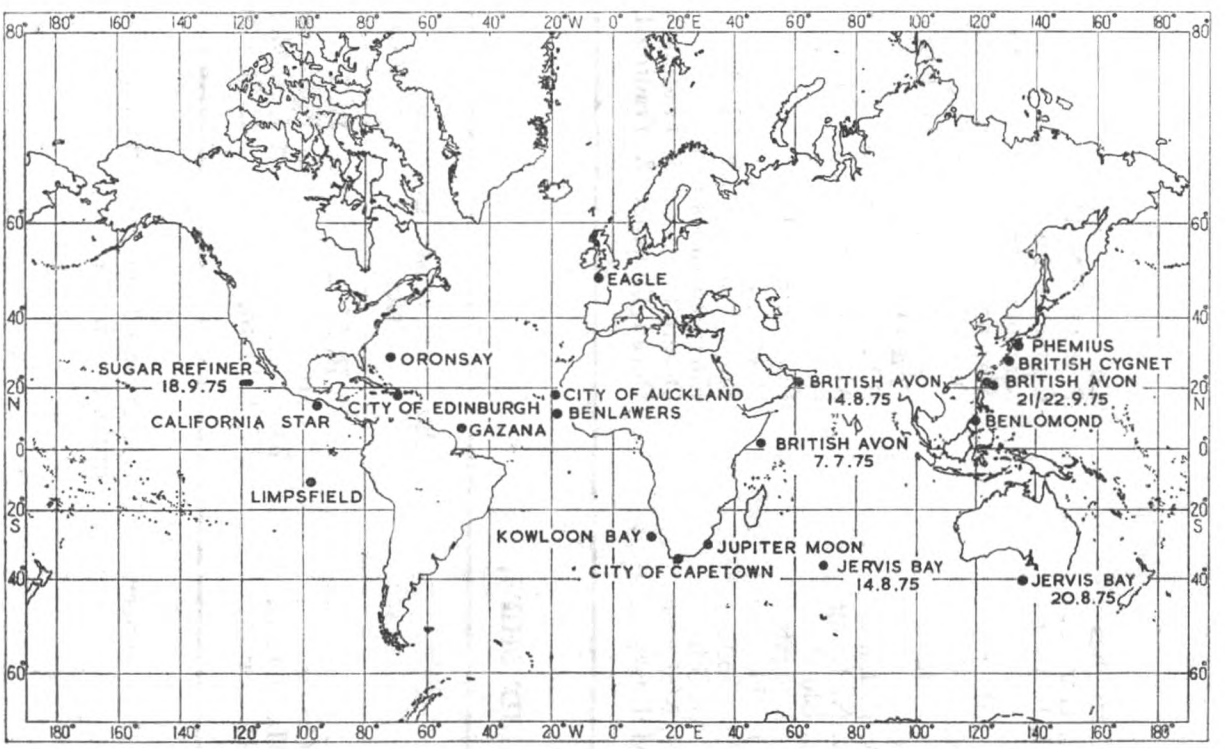
TRAWLERS (non-instrumental)

Skipper	Radio Operator	Trawler Owners
P. Garner		Boyd Line Ltd.
W. Harris		Northern Trawlers Ltd.
R. Jopling		Hellyer Bros. Ltd.
J. N. Kerr		British United Trawlers Ltd.
T. W. Pembroke ..		British United Trawlers Ltd.
C. H. Pitt		Boyd Line Ltd.
D. Platten		T. Hamling & Co. Ltd.
M. Redfearn ..		British United Trawlers Ltd.
	B. H. Colley	British United Trawlers Ltd.
	G. A. Ellis	Boyd Line Ltd.
	A. Fulcher	Hudson Bros. Trawlers Ltd.
	E. J. Moffatt	J. Marr & Son Ltd.
	H. C. Pougher	Northern Trawlers Ltd.
	R. Spall	British United Trawlers Ltd.
	A. Spence	Boyd Line Ltd.
	A. Wilkinson	T. Hamling & Co. Ltd.

The recipients of the Awards will be notified by post and requested to provide an address to which the Award may be sent. Any Master or Officer seeing his name in this list, or in any other list published by his Company, before hearing individually from us, is requested to write and claim his Award giving us a forwarding address.

The initial Award is normally *The University Atlas*, followed by *Cassell's English Dictionary* as a second Award. The book selected this year as the third Award is *The Life-giving Sea* by David Bellamy.

J.D.B.



Position of ships whose reports appear in *The Marine Observer's Log*.

July, August, September

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

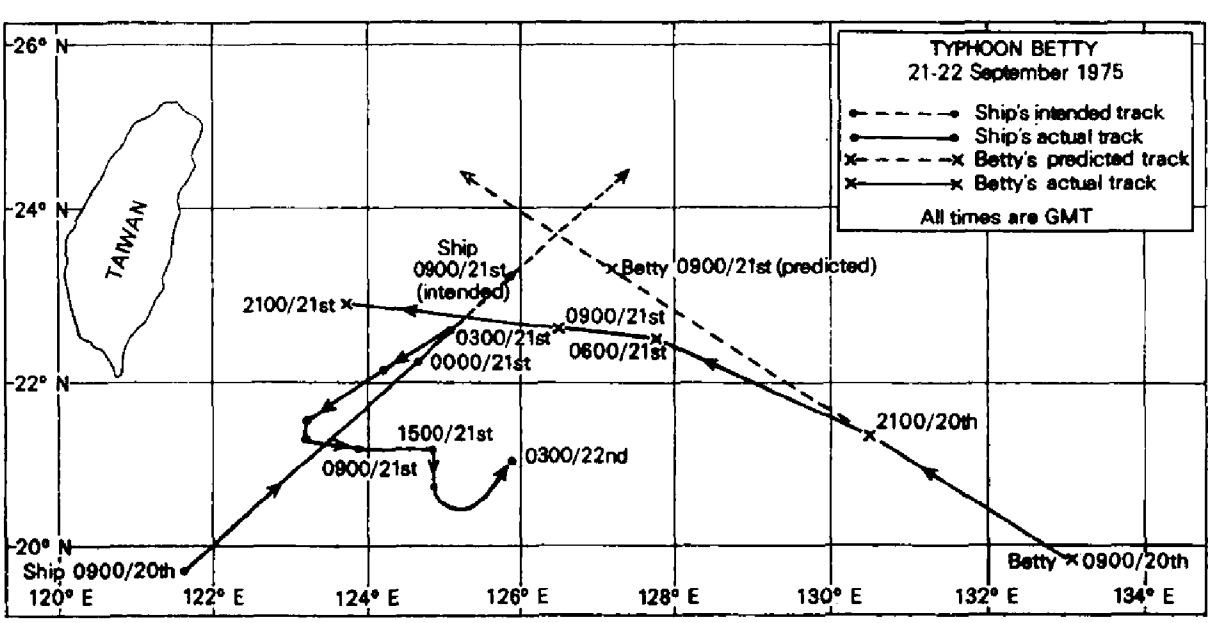
Observing officers are reminded that preserved samples of discoloured water, luminescent water etc. considerably enhance the value of such an observation. Port Meteorological Officers in the U.K. will supply bottles, preservative and instructions on request.

TYPHOON 'BETTY'

North Pacific Ocean

m.v. *British Avon.* Captain I. B. McNaughton. Singapore to Kawasaki. Observers, the Master and members of the crew.

21 September 1975. The noon-sight for the 21st was taken at 0335 GMT. Shortly afterwards it was decided that in view of our predicted meeting with typhoon Betty between 1000 and 1100, avoiding action would be taken; accordingly a course of 245°T was set keeping the wind approximately two points abaft the starboard beam. At this time the wind was N'E, force 7–8, the seas were rough and the barometer reading 1004·9 mb. The reversal in our course was accompanied by a fall in pressure. This steadied for a while then started to fall again—no more than was expected with Betty closing slightly.



During the next few hours the wind continued to back and the barometer remained fairly steady. At 1200 the wind was NNW, force 7–8, seas rough and the barometer reading 1003·0 mb.

The latest position for Betty reported by Tokyo Meteorological Office and timed 0600 showed the typhoon to be maintaining a WNW'ly course and it was decided to run east for a few hours in order to position ourselves behind it, and then continue on the original course. Almost immediately, the pressure began to fall, and the wind speed increased slightly to a steady force 8 and remained so for a few hours.

At 1500 we received the 1200 GMT weather chart and it was clear that Betty had altered course and that we were closer than we would have wished. Accordingly we altered course to 180°T. The wind was now NW'N, force 8, the seas were heavy, the barometer reading 997·7 mb and there were frequent heavy rain showers.

The pressure continued to fall until about 1700 when the trace on the barograph seemed to begin a series of 'hiccups' and to rise. The wind, although remaining at force 8, backed again and by 2200, when our original course was resumed, it was WSW, force 7. The seas were heavy and the pressure reading 1001 mb.

Position of ship at 0000 on 21 September: 22° 06'N, 124° 18'E.
Position of ship at 0000 on 22 September: 20° 24'N, 125° 48'E.

TYPHOON 'RITA'

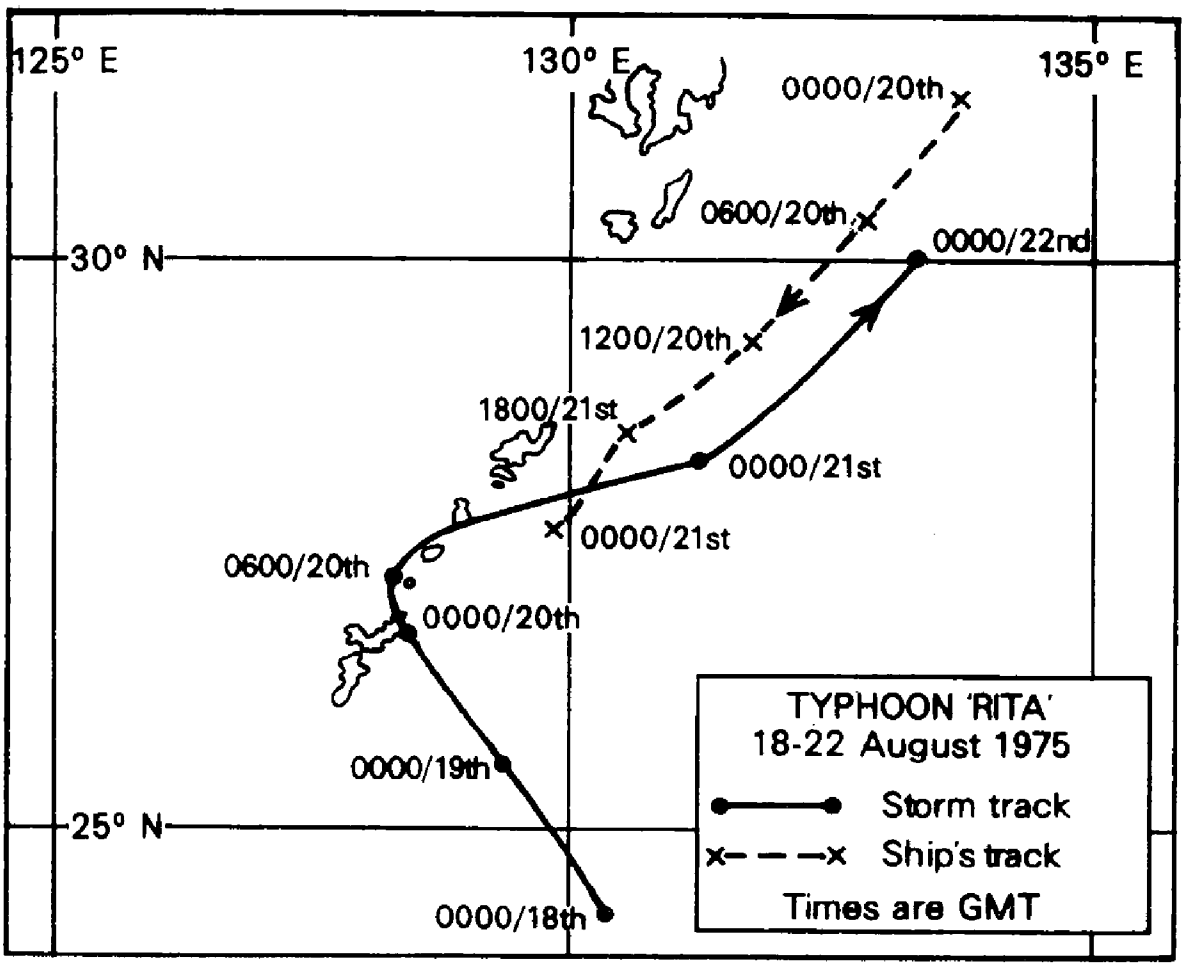
East China Sea

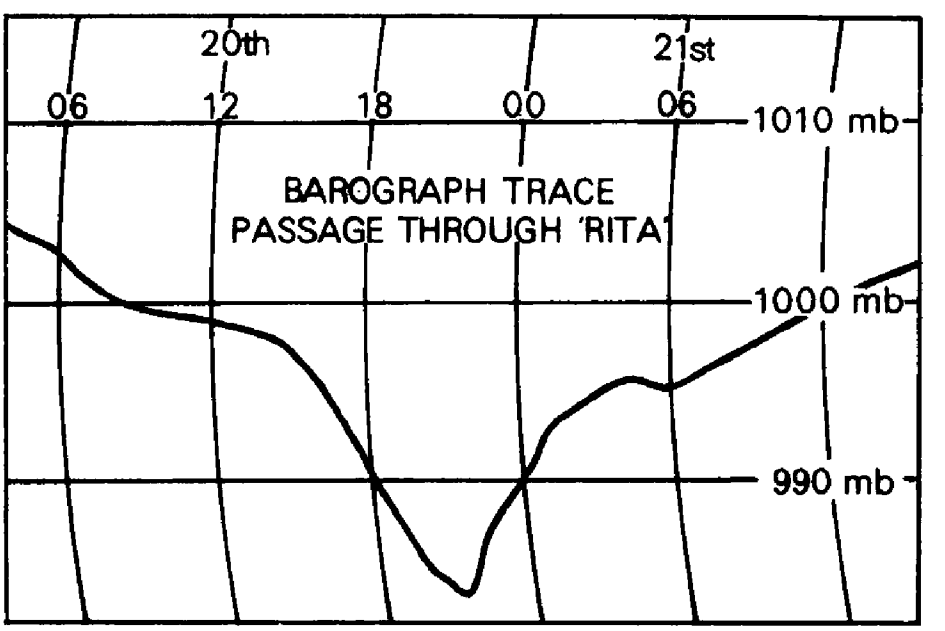
m.v. *British Cygnet*. Captain R. Towell. Yokkaichi to Bombay. Observers, Mr J. A. West, 2nd Officer, Mr M. A. Gough and Mr D. A. Day, 3rd Officers.

20 August 1975. At 1225 GMT in position 29° 18'N, 131° 42'E we received the weather forecast from Shai Observatory advising that a tropical storm centred at 0600 on the 20th in position 27° 06'N, 128° 12'E was expected to move NW at 6 knots. The forecast at 0118 on the 21st from Hong Kong advised that the tropical storm had changed direction and was now expected to move NE at 5 knots. At 0001 on the 21st the storm centre was located in position 28° 12'N, 131° 18'E. By the time it was realized that the storm had changed direction we were unavoidably in its path. The following details have been extracted from the logbook.

20 August
GMT
1500: Wind SE, 16 kn. Pressure 997·0 mb. Sea rough with a SW swell running.
1600: Wind SE, 22 kn. Pressure 995·0 mb. Sea rough. Sky overcast, signs of rain 24 n. mile distant on radar screen.
1700: Wind ESE, 27 kn. Pressure 992·9 mb. Sea rough. Intermittent drizzle. Visibility reduced to 6–7 n. mile in drizzle.
1800: Wind E'ly, 33 kn. Pressure 990·6 mb. Sea rough–heavy. Rain. Visibility down to 3 n. mile in places. Swell becoming longer and heavier.
1900: Wind E'N, 33 kn. Pressure 986·7 mb. Sea rough–heavy.
2000: Wind ENE, 37 kn. Pressure 983·3 mb. Sea heavy. Heavy rain at times.
2030: Wind NE, 13 kn. Pressure 983·7 mb. Sea heavy. Wind decreased and now variable NE'ly. Rain became drizzle. Thought to be near centre of storm in position 28° 03'N, 130° 20'E.
2100: Wind N'ly, 30 kn. Pressure 983·6 mb. Sea heavy. Very dark to the west. Patches of drizzle becoming more frequent.
2145: Heavy rain reducing visibility.
2200: Wind NW, 44 kn. Pressure 984·6 mb. Sea heavy. Heavy rain and driving spray. Visibility 1 n. mile. Vessel on slow speed and sounding fog signals.
2230: Heavy rain continues. Visibility almost nil at times.

2300: Wind w'ly, 40 kn. Pressure 988·3 mb. Sea heavy. Sky still dark although looking brighter. Rain still heavy. Visibility improving.
2330: Sky brightened considerably, still overcast but rain giving way to heavy showers. Visibility improved to 6 n. mile. Vessel increasing speed.





21 August
0001: Wind w'ly, 40 kn. Pressure 991·0 mb. Sea heavy. Weather progressively improving throughout the day.
0300: Wind w'ly, 30 kn. Pressure 996·0 mb. Sea rough to heavy.
0400: Showers cease.
0630: Clouds begin to break.
0700: Wind w'ly, 30 kn. Pressure 997·4 mb.
1100: Wind w'ly, 21 kn. Pressure 1000·0 mb.

Position of ship at 2030 on 20th: 28° 03′N, 130° 20′E.

Note. The accompanying chart shows the tracks of the *British Cygnet* and tropical storm, later typhoon, Rita. Shortly after 0600 on the 20th Rita recurved ENE and increased speed from 5 to 10 knots, to cross the ship's path. At 2030 the *British Cygnet* was briefly in the eye of the storm. Rita subsequently deepened, crossing Japan and causing extensive damage. In the mountains of Honshu up to 660 mm of rain were reported and on Hokkaido floods and landslides along the Ishikari river valley resulted in eight deaths.

LOCAL WINDS

Gulf of Tehuantepec

m.v. *California Star*. Captain I. C. Mackintosh. Los Angeles to Le Havre. Observers, Mr N. J. Barr, 2nd Officer and Mr G. S. Hart, 3rd Officer.

This vessel has gradually built up a reputation for encountering bad weather in the region of the Pacific Coast of Mexico. In 1973 the ship was homeward-bound from Los Angeles with a cargo which included the famous *Flying Scotsman*. The conditions encountered on that occasion could never be met on British Railways, consisting, as they did, of near hurricane-force winds and a mountainous swell lasting two days before reaching the sanctuary of calmer waters.

21 September 1975. At 0200 GMT as we passed Acapulco the winds were light variable. By 1600 we were entering the area of the Gulf of Tehuantepec and the wind began to freshen from the north. By 1800 the wind had reached force 6 from the north and a very prominent northerly swell was building up causing the ship to roll moderately. By 1900 a belt of rain running NE to SW across our track was visible on the radar screen. From its appearance it was a very narrow belt of very heavy rain. Within 30 minutes we had reached the rain belt and as we entered it the wind dropped very quickly. Ten minutes later we were in bright sunshine and light N'ly winds—the belt of heavy rain appeared to mark the limit of the strong winds.

The facsimile weather-analysis chart showed that tropical storm 'Eloise' was situated over the Yucatan Peninsula producing a northerly airflow through the mountains on either side of the Isthmus of Tehuantepec. The wind funnelled out over the Gulf and progressively built up a heavy swell.

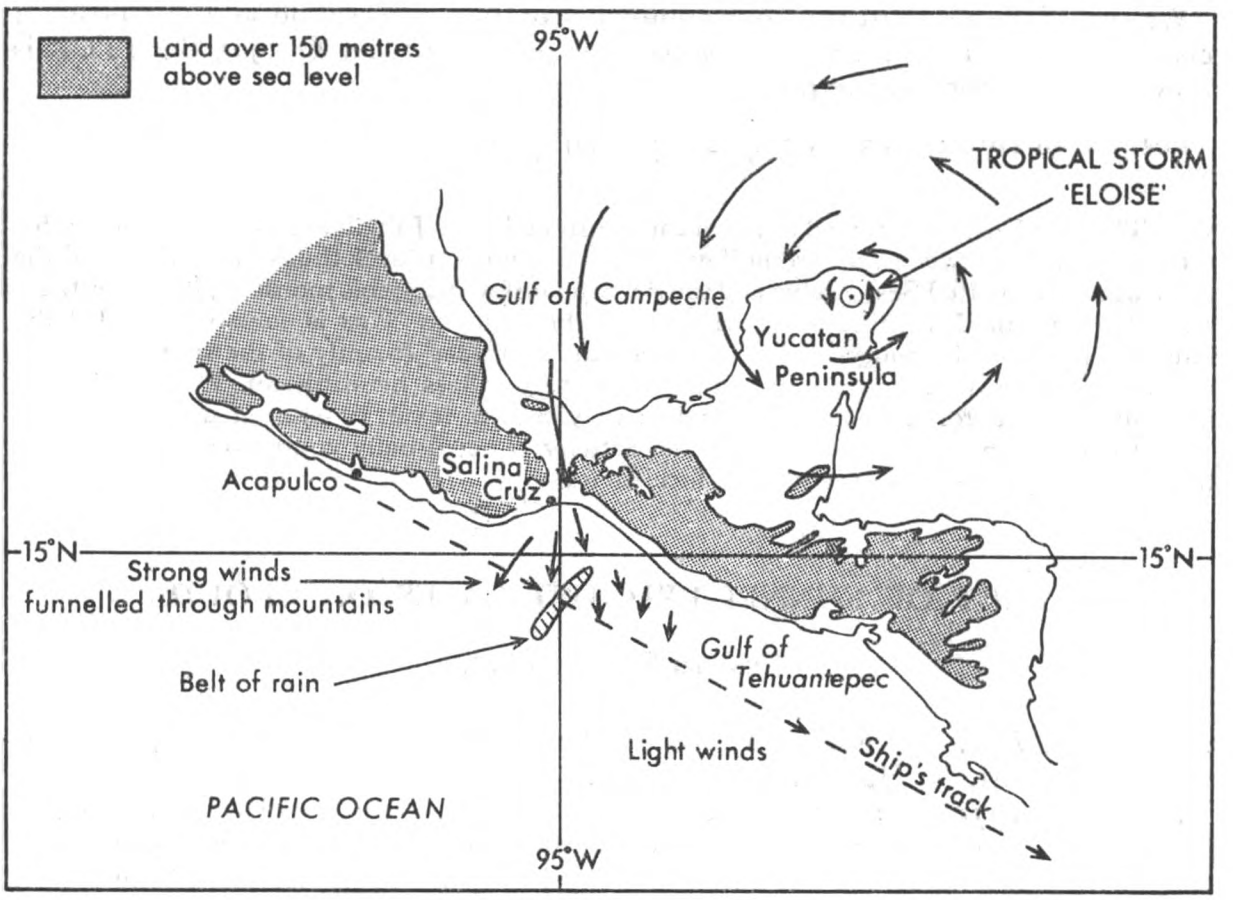
Experience has shown that the further away from the coast we are, in the Gulf, the stronger is the wind and the heavier the swell.

It might be of interest to record that masters and officers on this vessel have collectively nicknamed the Gulf of Tehuantepec 'Windy Gap'.

The following are details extracted from the logbook:

GMT
1200: Wind WNW, force 3. Sea slight.
1500: Wind NNE, force 5. Sea moderate to rough.
1800: Wind NNE, force 6. Sea rough.
1930: Wind N'E, force 3. Sea slight.

Position of ship at 1800: 13° 54′N, 95° 00′W.



Note. An earlier report of the 'Tehuantepecer' from the *California Star* was published in the April 1974 edition of *The Marine Observer*. In the *Note* which followed that report it was stated that in a northerly air flow a funnelling of the wind takes place through the Isthmus of Tehuantepec owing to the land topography. The effects may be felt as far as about 100 n. mile from the coast in the region of the Gulf. These 'northers' may occur at any time of the year but are more frequent during November, December and January. One-seventh of the Tehuantepecers reach force 10–12 and the onset may or may not be accompanied by rain or squall cloud. Further, the barometer cannot be relied upon to give any warning of this wind and significant air-temperature fluctuations are unusual, though sea-surface temperatures may fall after the onset owing to upwelling.

THE SOUTHERN EQUATORIAL TROUGH

Indian Ocean

m.v. *British Avon*. Captain I. B. McNaughton. Durban to Bandar Ma'shur. Observers, the Master and Mr J. E. Howe, 2nd Officer.

7 July 1975. At 0930 GMT steering course 025°T at 16·5 kn torrential rain was encountered. The visibility dropped rapidly and the engines were put on stand-by and the speed reduced. During the next few minutes the wind veered and decreased slightly from 140°T, 16 kn (estimated) to 230°T, 13 kn. Bearing in mind the ship's position and the weather conditions encountered, it was thought that the vessel had passed through the Intertropical Convergence Zone (ITCZ). The other weather conditions at the time of the observations were as follows.

Pressure 1012·0 mb (corrected), air temp. 27·0°C and wet bulb 24·8.

We would be grateful for your comments on our observation and our position relative to the ITCZ as, in *Meteorology for Mariners* (Met O 593), the ITCZ is shown to be further to the north.

Position of ship at 0930 GMT: 02° 13′N, 49° 35′E.

Note. The ITCZ is, in fact, well north of this position during July, lying over southern Arabia as the boundary between the strong flow of the SW monsoon (over the Arabian Sea) and the NW'ly winds of the Red Sea, Arabia and the Persian Gulf. During this monsoon, however, there is another line of discontinuity in winds near the Equator. This is sometimes called the Southern Equatorial Trough and lies between the SE 'trades' (mainly of the southern hemisphere) and the SW monsoon winds (mainly of the northern hemisphere). The structure of the Southern Equatorial Trough is not adequately known. It can be associated with ascent of air and consequent cloud and rain but the activity is not usually continuous. Stretches of the trough may have no rain and even little cloud.

EFFECT OF FUNNEL-EXHAUST GASES ON CLOUDS

Eastern South Atlantic

s.s. *Kowloon Bay.* Captain D. T. Maclachlan. Port Kelang to Southampton. Observer, Mr B. M. N. Hamzah, 2nd Officer.

17 August 1975. At approximately 0800 GMT, whilst the vessel was steaming at about 26 knots on a course of 323°T, it was noticed that the hot funnel-exhaust gases were having an unusual effect on the low cumulus clouds in the vicinity of the vessel. The wind at the time was SSE at an estimated speed of 28 kn and therefore the exhaust gases from the funnel rose vertically at first and then very slowly drifted out to starboard and forward in an arc.

Close observation of a small cloud from the starboard bow revealed that the cloud was rotating on a horizontal plane in a clockwise direction as would be seen from above, and also turning, again in a clockwise direction, in the vertical plane. The vertical turning movement appeared to be $2\frac{1}{2}$–3 times faster than the horizontal movement. There also appeared to be a tendency for the cloud to be 'sucked' towards the rising exhaust gases. Further observation of other clouds showed that this latter tendency was more accentuated on clouds abaft the beam than those forward. In addition, as the clouds began their movement towards the rising exhaust gases, the smaller clouds began to dissipate and the larger ones to assume a more ragged appearance. On closer approach to the gases the smaller clouds dissolved completely, and the larger were much reduced in size. When over the ship the latter were lifted to a higher level where they either dissolved or spread out into a thin layer.

Air temp. 17·9°C, wet bulb 15·6. Cloud, 1 okta small cumulus with ragged edges and little vertical extent but having well-defined bases.

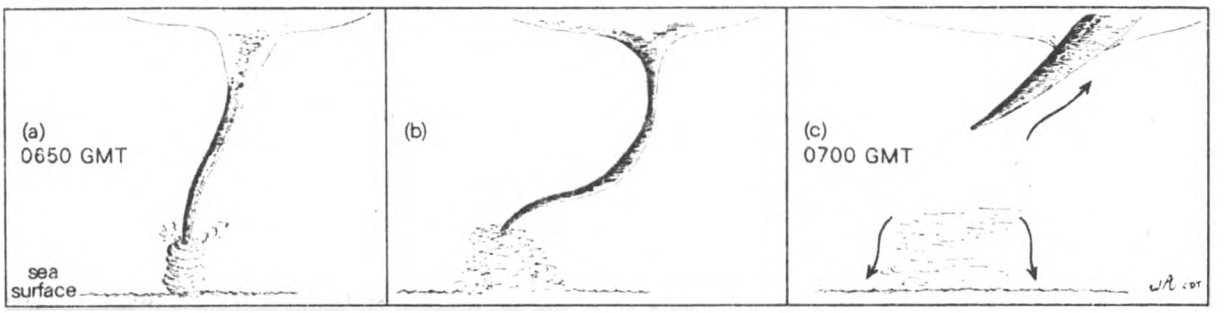
Position of ship: 28° 00′S, 13° 06′E.

Note. The rotation of small clouds described above was caused by turbulence as rising warm exhaust gases entrained surrounding air.

WATERSPOUT

Sulu Sea

s.s. *Benlomond.* Captain A. Yuill. Masinloc to Sandakan. Observers, Mr C. J. A. Cladingbowl, 2nd Officer and Mr W. Arthur, Cadet.



27 August 1975. At 0650 GMT a waterspout, bearing 255°T, range 5 n. mile by radar, was observed just after the vessel had emerged from a heavy rain shower. The tail gradually retreated into the cloud ten minutes after it was first observed. The column of water 1–2 m above sea level eventually dissipated amidst a cloud of spray.

The sketches show the stages of the waterspout during the final ten minutes of its life. The bending of the column by vertical wind shear is clearly shown in sketches (a) and (b).

Position of ship: 09° 38′N, 119° 57′E.

ST ELMO'S FIRE

Caribbean Sea

s.s. *City of Edinburgh.* Captain S. Murray. Rotterdam to Cristobal. Observers, Mr N. Macnish, 1st Officer and Mr B. Wood, Cadet.

21 September 1975. At 0600 GMT the vessel was proceeding through the Mona Passage in a thunderstorm when St Elmo's Fire was observed on the bridge-wing whip-aerials and on the loud-hailer brackets. At the top of the aerial and at each joint a purple-coloured glow was seen. On the loud-hailer brackets sparks in rapid succession gave the impression of a flame. The sparks were 10–15 mm long, they came vertically out of the brackets and were again purple-coloured. The phenomenon, which was at all times accompanied by a faint hissing sound, lasted for about two hours.

Position of ship: 17° 30′N, 69° 10′W.

CURRENT RIP

North Atlantic Ocean

m.v. *Gazana.* Captain R. Baily. Mina al Ahmadi to Minatitlan. Observer Mr N. Stevens, 3rd Officer.

8 September 1975. At 1200 GMT whilst on a course of 299°T at a speed of 18 knots, a line of very confused seas with many white crests was observed some 10 n. mile SW of the vessel. As the vessel proceeded along her course, it became apparent that she was converging with this line and in fact crossed it at 1400. The line was about 100 metres in width and a check on the compass showed it to be running NW/SE.

The sea temperature at 1200 was 26·5°C and when read again at 1415 was found to be 29·0. At 1415 the line began to converge again and by 1430 the vessel was running along in the centre of the disturbed water. At 1450 the sea temperature from within the disturbed water was 28·0 and at 1500, when the line had begun to diverge to the SW again, the sea temperature was 27·0.

The ship's position at 1500 was approximately 5° 42′N, 49° 33′W and as the ship proceeded, the line continued to diverge but remained visible until 1530 at which time the sea temperature was again 29·0.

The wind was from the east throughout but increased from force 3 at 1130 to force 4–5 by 1200, at which force it remained until 1530 when it began to decrease and by 1600 was again force 3. A swell of approximately one metre was running ESE throughout.

At all times when the vessel was crossing or proceeding within this line of disturbed water, there was an increase in vibration and the wake, which had previously been visible for two or three n. mile, was soon lost within the first two or three cables astern.

Position of ship at 1200: 5° 18′N, 48° 50′W.

Note 1. The *Gazana* experienced a current rip, probably at the confluence of the main WNW-going South Equatorial current and an inshore branch, induced by the coastline to set NW and reinforced by water from the River Amazon.

Note 2. The following is an extract from the *South America Pilot*, Volume 1:

'The waters of Rio Amazonas rise during six months, and then, having reached their highest level, fall during the other six months of the year. During August and September, the snow on Cordillera de los Andes begins to melt, but its influence is only slowly felt by Rio Amazonas. The river begins to rise in November; the inundations in its lower parts take place from January to May inclusive; the north-easterly winds, which then prevail and blow fresh at the mouth of the river, retard the stream and contribute greatly to the inundations.

'The rise is from 9 to 15 metres and, at times, the whole basin is under water. By a singular operation of natural causes, the water in the southern tributaries of Rio Amazonas is high, while that in the northern ones is low, and vice versa. In Rio Madeira, a southern tributary, the water is at its highest in April, the difference between high and low river being about 15 metres.

'The outflow of muddy water from Rio Amazonas discolours the ocean to a distance of up to about 70 n. mile from its mouth; its limits are well-defined by the abrupt change of colour. Northward of the mouth, the South Equatorial current sets north-westward and deflects the river current; it has been reported that the stream of Rio Amazonas has been found in Lat. 5°N, Long. 50¾°W. A vessel outside the line of demarcation, where the ocean water is of a bluish-green colour, has been observed frequently to leave a wake of muddy water, in sharp contrast with the surface water; this phenomenon occurs in depths of up to 15 metres, and is caused by the lower layers of river water extending further seaward than the surface layer.'

RADAR ECHOES

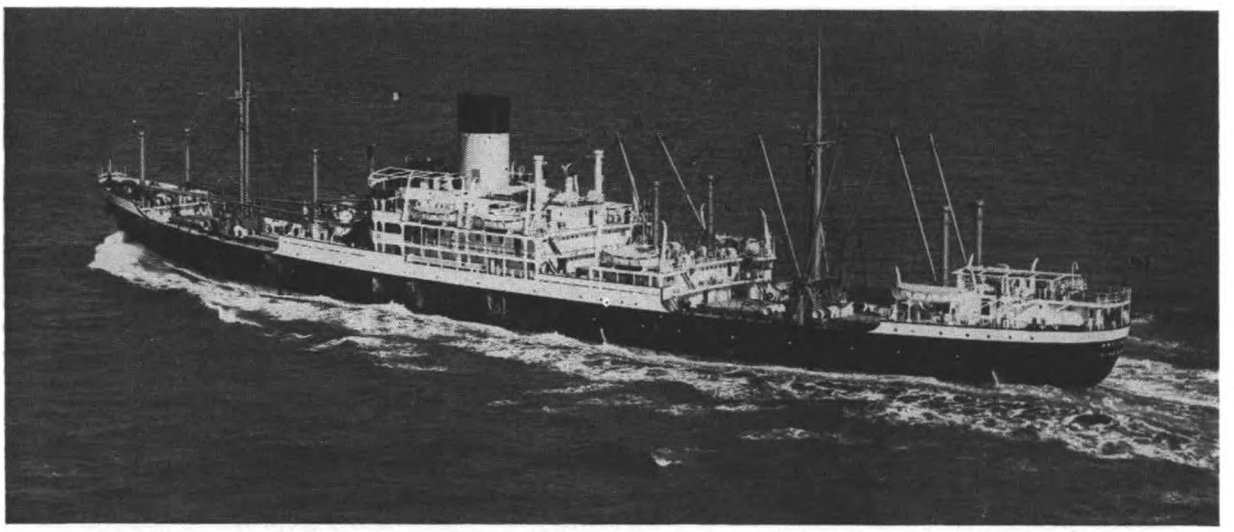
South African waters

m.v. *Jupiter Moon*. Captain R. G. Macdonald. East London to Durban. Observers, the Master and Mr C. J. Hondius, Chief Officer.

m.v. *Jupiter Moon* is a South African Selected Ship.

14 August 1975. At 0555 GMT unidentified echoes to seaward were observed on the radar screen (see photograph opposite page 109). The coastline was just discernible in the haze and no cloud-line could be seen in the direction of the echoes. The other weather details at this time were as follows: air temp. 22·8°C, wet bulb 18·5, sea temp. 20·8, wind NNE, force 2 (during the previous six hours the wind had shifted frequently), pressure 1008·1 mb, visibility 7 n. mile.

(*Opposite page* 108)



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Antilochus (Ocean Transport & Trading Ltd.), Captain A. J. Palmer.

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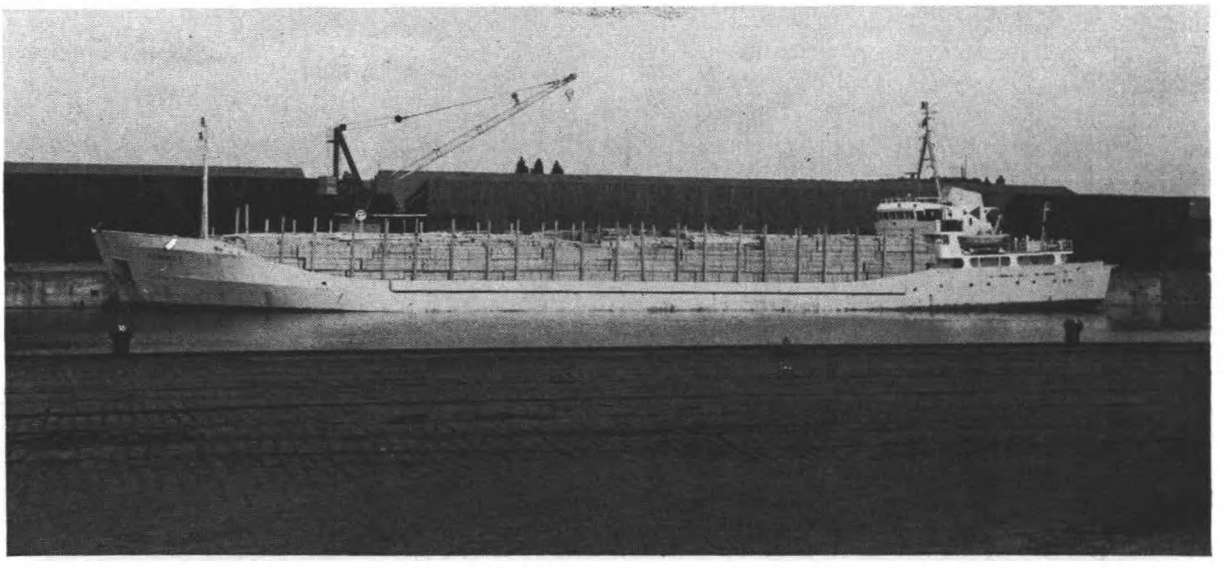
Mayfield (Shaw Savill & Albion Co. Ltd.), Captain J. Ferres.



Summity (F. T. Everard & Sons Ltd.), Captain W. G. Hunt.

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKINGS FOR THEIR METEOROLOGICAL LOGBOOKS DURING THE YEAR 1975 (*see* page 94).

(*Opposite page* 109)

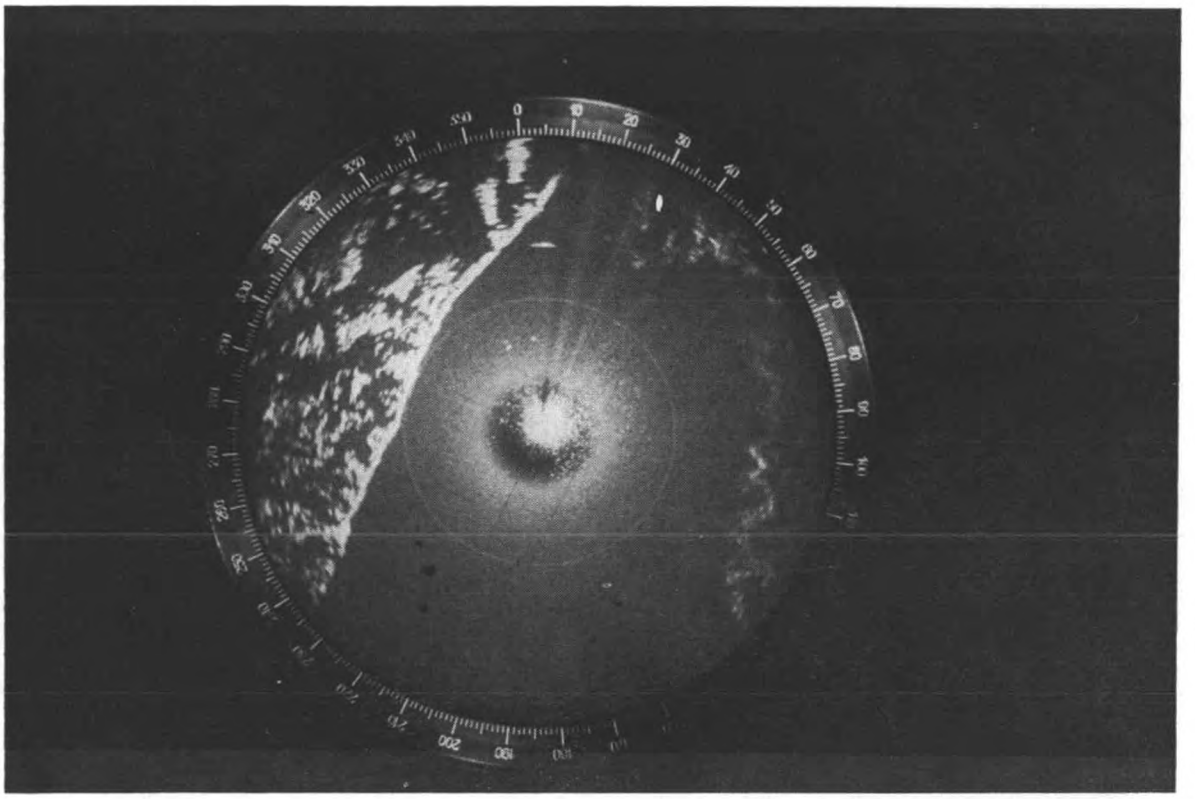


Photo by Captain R. G. Macdonald

The radar screen of the *Jupiter Moon* showing the echoes observed on 14 August 1975 on the 12 n. mile range (*see* page 108).

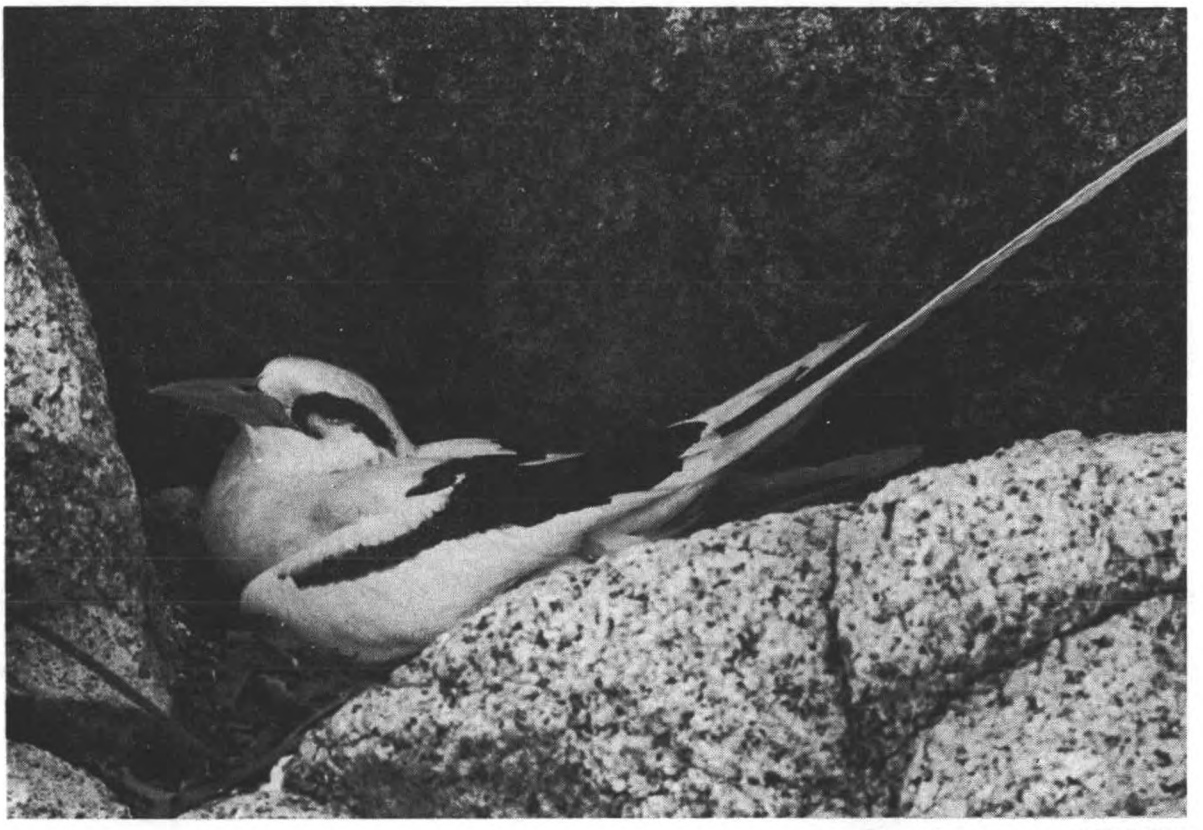
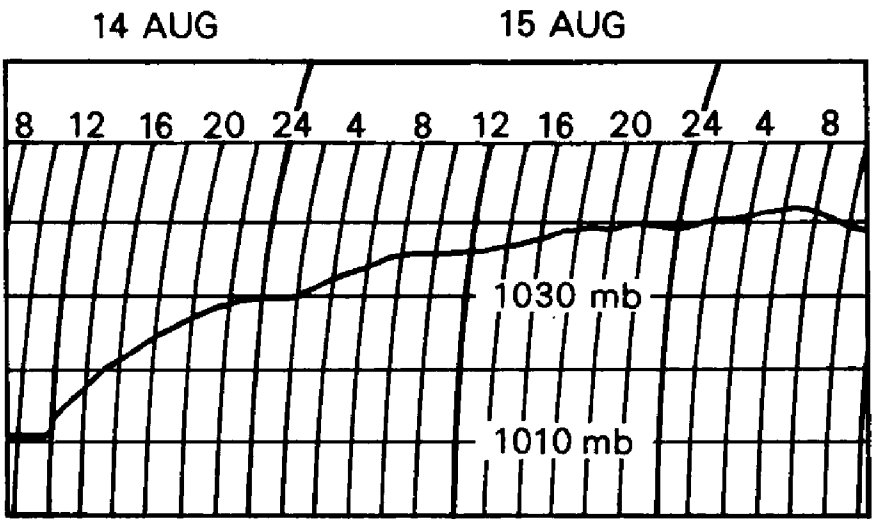


Photo by courtesy of RNBWS

An adult White-tailed Tropic-bird (*Phaeton lepturus*) (*see* page 111).

On berthing at Durban at 0830 the Pilot advised that a strong westerly wind was due. The strong westerly duly arrived at 1200 and was accompanied by rises in pressure as indicated on the barograph trace (see sketch).

Position of ship: 30° 07·5′S, 30° 58′E.



Note 1. Mr R. G. Flavell of the Radio Society of Great Britain comments:

'We had hoped to be able to investigate the refractive index structure of the troposphere in the neighbourhood of the ship. Unfortunately, however, the Meteorological Station at Durban does not carry out TEMP soundings (investigation of upper-air conditions), and the nearest place that does is too far away to be of value for such a local event. However, the wave-like appearance of the radar patterns forming the subject of the report closely resembles observations of clear-air turbulence as described in a number of meteorological contexts in recent years. The subject has been treated at length in a paper by Ottersten, Hardy and Little entitled *Radar and Sodar Probing of Waves and Turbulence in Statically Stable Clear-air Layers*, published in *Boundary-layer Meteorology*, Vol. 4, 1973, pp. 47–89. The authors describe a case illustrating a single-layer echo at about 6 n. mile which was shown to develop a wave formation which broke and evolved into a braided structure, rich in echo, finally becoming a double layer after some 15 minutes, a time very comparable with the duration of the phenomena reported by the observers.

'This aspect of the paper drew heavily on work carried out by Browning and Watkins of the Meteorological Research Unit, Royal Radar Establishment at Malvern, written up originally in *Nature*, Vol. 227, 1970, pp. 260–263 under the title *Clear-air Turbulence by High-power Radar*. Perhaps you might consider inviting Dr Browning to comment on the photograph as well.'

Note 2. Dr Browning comments:

'High-power 10-cm radar with large aerials can pick up echoes from refractive index fluctuations due mainly to humidity gradients at an inversion capping the boundary layer at heights of typically one-third of, to a little over, one n. mile. The marine radar in this example, however, was probably a low-power 3-cm radar with a small aerial, all of which would indicate that it could not have detected echoes of that kind. On the other hand, swarms of insects occasionally congregate at, beneath or above such air-mass boundaries and these might well be detected by this kind of radar. Insects sometimes stay mainly within a given air mass in such a way as to tend to outline the wave-like boundary of that air mass. The winds in the present example were weak and variable which is not inconsistent with insects having been carried seawards from the nearby land mass.

'I do not know what are the beam-width characteristics of this marine radar or the elevation angle at which the beam was carried. If it was centred at 2 degrees elevation, say, the photograph would be consistent with an inversion being intersected at a mean altitude of about one-third of one n. mile.

'The above is necessarily tentative in view of the limited amount of information available on this occasion.'

FISH

North Atlantic Ocean

m.v. *Benlawers*. Captain J. R. Rodger. Cape Town to Hull. Observers, Mr W. Sinclair, 2nd Officer, Mr I. MacIver, 3rd Officer, Mr C. Stevenson and Mr J. Lumsden, Cadets.

27 September 1975. Throughout the day numerous schools (about 50–100 per school) of what appeared to be Sperm whales were observed, all apparently heading in a northerly direction. Numerous schools of dolphins and a turtle were also observed. Most of the schools on sighting the ship headed towards us but on getting to within 200 m they all veered away. Several fish, which appeared to be like swordfish, were seen to skim across the surface of the water standing on their tails. These fish were about 1 m in length, silvery-blue in colour and had sharp snouts about ½ m in length.

Position of ship at 1200 GMT: 11° 36′N, 17° 30′W.

Note. Mr P. J. Whitehead, Department of Zoology, British Museum (Natural History), comments:

'The "swordfish" were most likely garfishes (Belonidae) or perhaps sauries (Scombresocidae).

'A garfish is described as being a fish with long spear-like snout and green bones.

'A saury is described as a long-billed sea-fish.'

SQUID

South Pacific Ocean

m.v. *Limpsfield*. Captain J. A. Williams. New Plymouth to Balboa. Observers, the Master, Mr I. Barker, 3rd Officer and Mr D. Lane.

6 August 1975. At 2330 GMT while the vessel was stopped a number of squid a little over a metre long were observed. They were, in the main, white or grey in colour and had reddish-brown fins and a band of the same colour on the body just behind the head (some had two bands). A stripe ran the length of the body but it was difficult to determine whether it ran down the topside or the underside.

They appeared in the glare of the decklights to be just drifting in the lee of the vessel (none were observed to windward) with their tentacles outstretched umbrella-fashion. As darkness increased they were to be seen just below the surface of the water but when we switched on the Aldis lamp they dived down away from the direct light; they soon reappeared when the light was switched off.

Another creature was observed in the light of the Aldis lamp. It appeared as a yellowish glow, somewhat similar to cats' eyes, which moved about very erratically. When one did come close enough to give us a better sighting, the cats' eyes proved to be the eyes of a small grey fish about 15 cm long.

Flying fish were also observed at the same time. Some of them were seen to be attempting to fly up the beam of the Aldis lamp with rather comical results.

At 2330 the air temp. was 21·8°C, wet bulb 21·0, sea 22·0. Wind E′N, force 4. Pressure 1015·2 mb. Sea and swell moderate. One okta of altocumulus (C_M 3).

Position of ship: 11° 34′S, 101° 37·5′W.

MARINE LIFE

North Pacific Ocean

m.v. *Sugar Refiner*. Captain C. N. L. Davies. Guaymas to Singapore. Observers, Mr J. H. Clark, Chief Officer, Mr R. N. Franklin, 2nd Officer and Mr G. Leith, 3rd Officer.

18 September 1975. From 1600 to 2300 GMT the vessel steamed through an extensive shoal of Velella. It was impossible to estimate the size of the shoal as it was visible along the ship's side only, but for most of the time as many as 90 could be counted passing down the side per minute; at other times several minutes would elapse during which none would be sighted.

During a stoppage at sea a specimen was caught in a bucket and preserved. While stopped, the Velella were observed to be making a southerly course at a speed sufficient to leave a small wake behind them. The wind was northerly, force 3 throughout.

Position of ship at 1600: 21° 28′N, 121° 51′W.
Position of ship at 2300: 21° 20′N, 123° 33′W.

Note. Dr P. F. S. Cornelius, Head of the Coelenterate Section, British Museum (Natural History), comments:

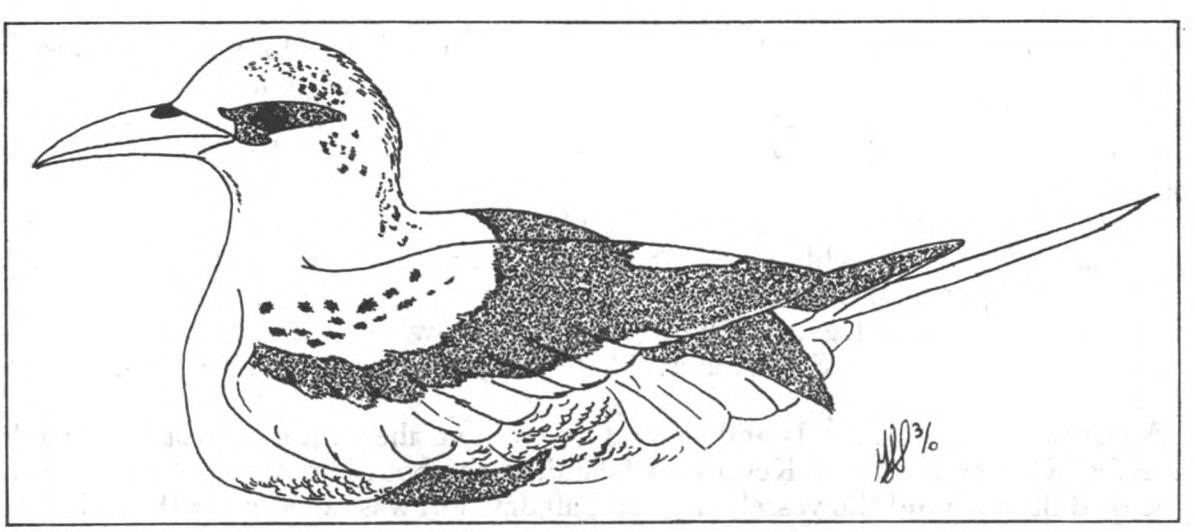
'Vast shoals of Velella are of course frequently reported but it is good to place another on file. I am grateful to the officers who procured the specimen, which will be placed in the collection.'

BIRDS

North Atlantic Ocean

m.v. *City of Auckland*. Captain F. Smith. Cape Town to Cardiff. Observers, the Master and crew.

8 July 1975. The bird reproduced in the sketch was found in the hatch stowage-space No. 4 by Mr B. Tucker, Deck Cadet. It appeared at first to be quite lively and no injuries were immediately obvious. It was easily approachable and showed no sign of fear unless roughly handled. It took some water and a small amount of fish.



The bird was silvery-white in colour, there were black edges to the wings, black marks around the eyes, and black and sooty-grey specks covered the back of the head. The tail, white in colour, was like a wide fan with a long narrow feather, 31 cm in length, protruding from the centre of the fan. The feet were black, narrow and

webbed. The overall length was 59·5 cm, beak 4–5 cm and wing-span 34 cm each wing. The Chief Engineer and three quartermasters tentatively identified the bird as a 'Bosunbird'.

The following day the bird showed little interest in life and was, for the main part, asleep. It did take some water but no food.

Late the same evening the bird was found dead by the 3rd Officer where it had been kept in a pulled-out drawer in the Cadets' study. The cause of death was not known. It is believed by many on board that the bird was suffering from internal injuries and came aboard to try to recover.

Position of ship at 1800 GMT: 17° 36′N, 18° 30′W.

Note. Captain G. S. Tuck, D.S.O., R.N., Chairman of the Royal Naval Birdwatching Society, comments:

'This is a very good description and an excellent sketch, of a Tropic-bird. These birds breed on the Cape Verde Islands. They are quite often found on the decks of ships as they follow them at night in search of squid thrown up by the ship's wake. The birds become confused by the lights, hit some part of the structure and fall to the deck dazed or stunned, where they are found next morning.

'Tropic-birds are beautiful white sea-birds of the tropical-ocean belts. They fly with quick strong wing-beats, usually at some height above the sea. There are 4 species.

Adult plumage

1. The Red-billed: Mainly white with black-topped primary wing feathers. Upper parts are finely covered with black barring, bill coral-red, legs yellowish, feet black, and long white central tail feathers.
2. The White-tailed: Similar to the Red-billed but upper parts are entirely white and crossed by a black band. Bill usually yellow, sometimes blackish, legs yellow, feet black. Plumage may show tinge of pink.
3. The Red-tailed: Silky white, shafts of primary wing-quills oily black, flank feathers streaked black, bill coral-red, legs pale blue, feet black, central tail feathers thin, blood-red.
4. Sub-species of the White-tailed Tropic-bird is the Christmas Island Tropic-bird found in the Indian Ocean. This is distinguished by the golden hue of its plumage.

Immature birds of all species show much barring over upper parts and lack elongated tail streamers. In adults in moult the tail streamers are sometimes absent or just growing.'

Indian Ocean

s.s. *Jervis Bay*. Captain L. E. Howell, Cape Town to Sydney. Observer, the Master.

14 August 1975. At 0330 GMT a small duck was observed flying, neck extended and with rapid wing-beat, around the vessel. It looked quite out of place amongst the soaring, gliding Albatrosses. Later it was clearly observed when it settled on the forecastle-head deck.

It was about 18–23 cm in length, the head was light velvety-brown, eyes appeared to be black, the bill slate-blue, underbody light fawn, body feathers light brown and dark brown, speckled. There were white tips to the edge of the innermost main flight feathers and the legs were light grey-blue. It walked with legs at a very bent angle as does a shuffling Shearwater. There were low quacking noises when it was disturbed.

Apart from Amsterdam Island—about 350 n. mile ahead, the nearest land would be either Crozet Island or Kerguelen Island, both about 800 n. mile to the south. The bird flew around the vessel on and off all day, but was not seen on the following day.

'In my many crossings at various latitudes in this ocean,' writes the Master, 'I have never before come across a duck!'

Position of ship at 0700: 36° 52′S, 69° 43′E.

Note. Captain G. S. Tuck, D.S.O., R.N., Chairman of the Royal Naval Birdwatching Society, comments:

'The reference to a duck which came aboard so far out to sea is, of course, most unusual. It was clearly a small duck and the nearest approximation might be the Hottentot Teal (*Anas hottentotta*) quoted as being 35 cm in length and the smallest duck in southern Africa. It shows a white edge to its speculum in flight as described, the flight is fast, it is usually seen in pairs and sometimes in flocks, but who knows from where such a duck could have come?'

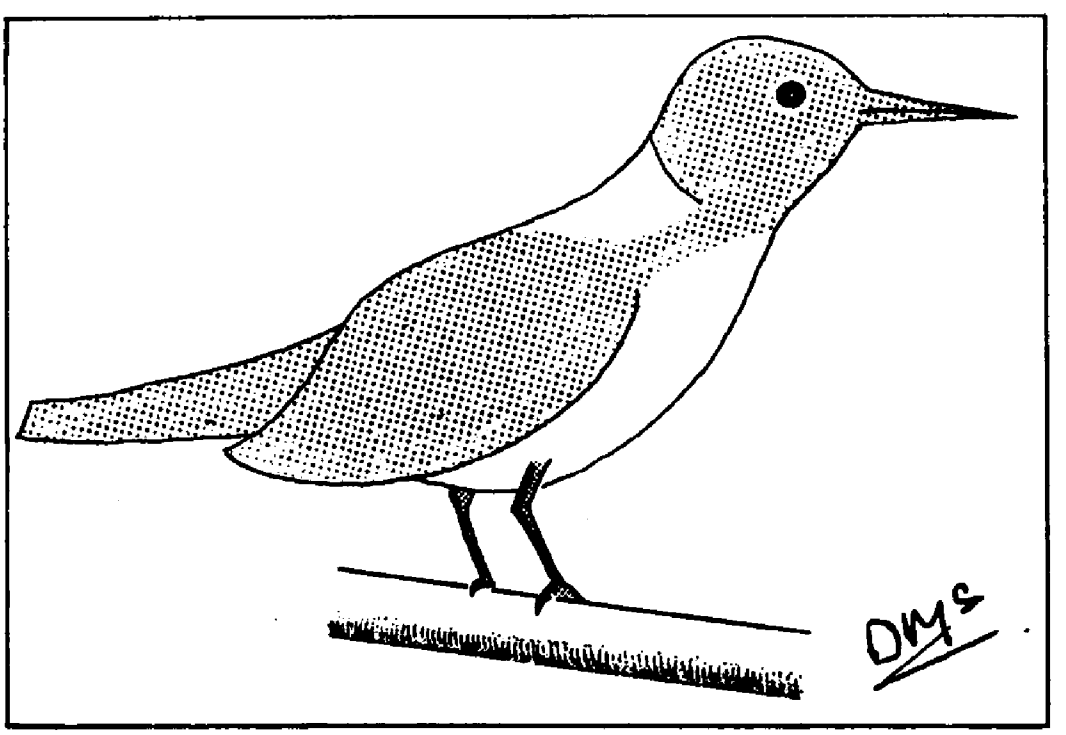
Arabian Sea

m.v. *British Avon.* Captain I. B. McNaughton. Ras Tanura to Kawasaki. Observer, Mr D. McCallum, Chief Officer.

14 August 1975. At 1330 GMT the bird shown in the sketch landed on the flying-bridge rails and stayed there for about ten minutes before flying off again.

The bird was about the same size as a skylark, the shaded areas in the sketch were black and the light areas a pale pink. As it spread its wings to balance against the wind, two other points were noted—the back and underside of the wing appeared to be pink, and the bird seemed to raise a crest when buffeted by the wind: this may, however, have been gusts of wind ruffling the feathers.

Position of ship: 22° 20′N, 61° 30′E.



Note. Captain G. S. Tuck, D.S.O., R.N., Chairman of the Royal Naval Birdwatching Society, comments:

'This is *Sturnas roseus*, a Rose-coloured Starling. The sketch giving positions of plumage is very useful. The bird shows a crest at times.'

North Pacific Ocean

m.v. *Sugar Refiner*. Captain C. N. L. Davies. Guaymas to Singapore. Observers, the Master, Mr G. J. B. Leith, 3rd Officer, Mr S. J. Hingston, 3rd Engineer and other members of the crew.

18 September 1975. At 1730 GMT a bird was observed as it landed on No. 1 Hatch; it was a smallish dark bird with light markings.

Mr Hingston, our bird-watcher, was informed and he tentatively identified the bird as a Black Turnstone in winter plumage. After three or four fruitless forays up the foredeck during succeeding nights, the bird was finally caught at midday on the 23rd in Mr Hingston's home-made bird trap—an old fruit box delicately balanced on a stick with rope attached, inside the box lay a bowl of gastronomical goodies—a spread the bird could not refuse.

On closer inspection the bird was definitely identified as a Black Turnstone. The upper parts were mostly a light brownish-grey with some lightly speckled buff on the crown and the nape. The underparts were mostly white or whitish with some buff colouring on the throat and breast, the wings carried a striking pattern in black and white.

It soon became obvious that the bird was very thin and bony. During the days before capture it had been observed trying to feed on some grain, residue of our cargo which may have been left lying in hatch tracks and in corners under the hatch coamings, but it obviously wasn't particularly enamoured of it. However, it did peck out and eat the eyes of a flying fish which was lying on deck; this was probably the only food taken before its capture.

For its first real meal we offered very finely chopped pieces of lamb, lean and fat alike, which it seemed to enjoy immensely. The next day we offered half a tin of sardines which it seemed to enjoy even more than the lamb. On this same day it indulged in a spot of the aquatic sports, almost drowning in a soup bowl filled with water in the process.

Within 24 hours of captivity, Fred, as the bird had been named, became very docile and friendly towards its guardian, Mr Hingston. It would feed from his hand and fly or jump to an outstretched hand or arm.

Position of ship at 1800 GMT on 18 September: 21° 30'N, 122° 18'W.

South Australian waters

s.s. *Jervis Bay*. Captain L. E. Howell. Cape Town to Sydney. Observers, the Master, Mr P. Wood and Mr A. J. Fee, 2nd Officers.

20 August 1975. During the day a number of different species of Albatross were sighted and all but one was identified. The unknown, and one which followed the vessel all day, was all-white (Albino?), except for isolated patches of colour on the body and upper wings and a yellow bill. In both shape and size it resembled the black-browed Albatross.

Position of ship at 1200 GMT: 40° 30'S, 135° 06'E.

Note. Captain G. S. Tuck, D.S.O., R.N., Chairman of the Royal Naval Birdwatching Society, comments:

'I feel it may have been the less usual All-white Giant Petrel of the southern type (*Macronectis giganteus*). They may be juvenile or adult, the white feathers being acquired at the nest, and birds remain white for life. A few are wholly white but most have some black spots. All-white birds may have ivory horn-bills and flesh-coloured legs.'

INSECT

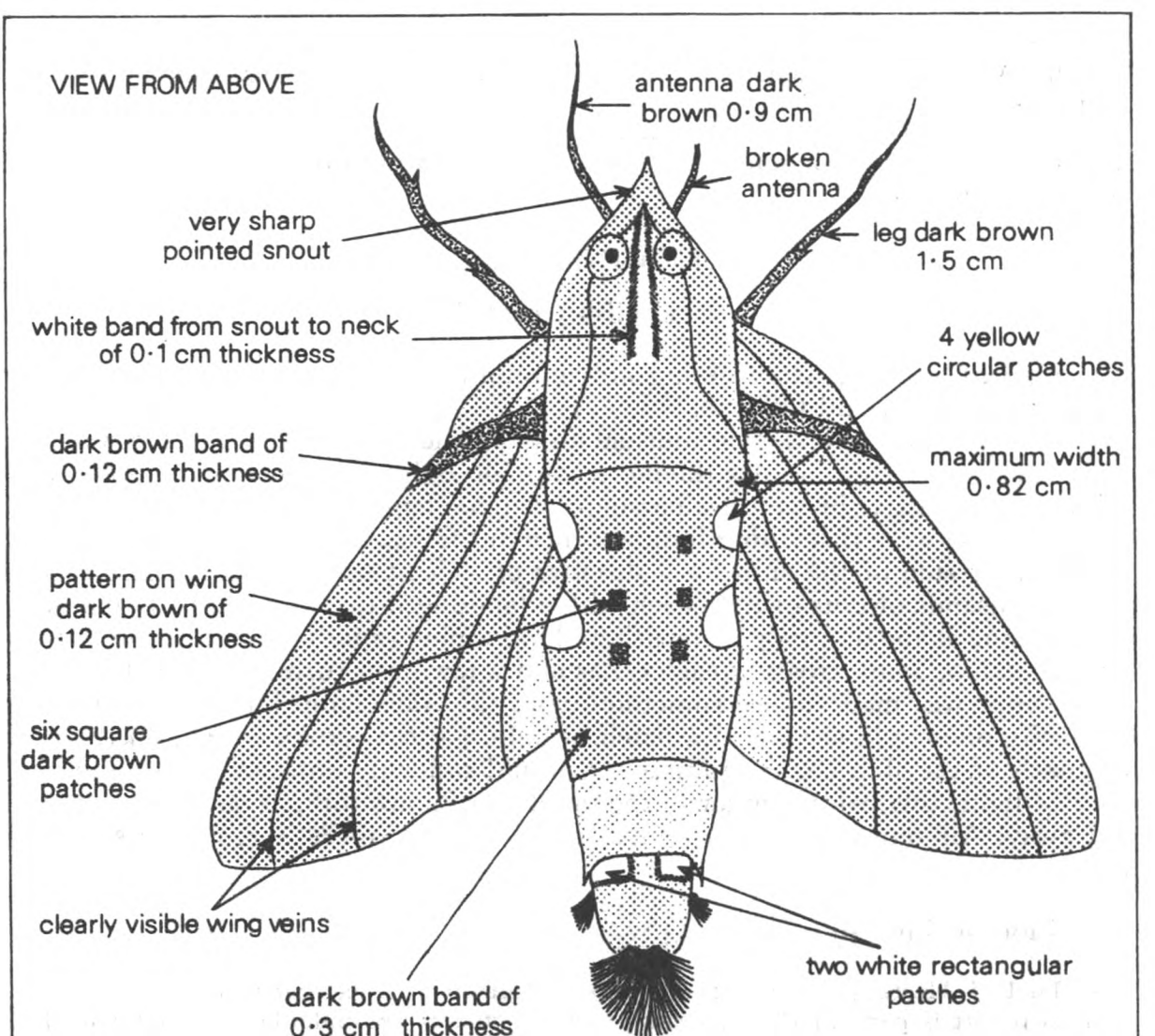
Pacific Ocean

m.v. *Phemius*. Captain R. J. Paterson, Keelung to Kobe. Observers, the Master, Mr G. J. Roberts, 2nd Officer, Mr R. M. Selvarajah, 3rd Officer and Mr R. Cooper, Cadet .

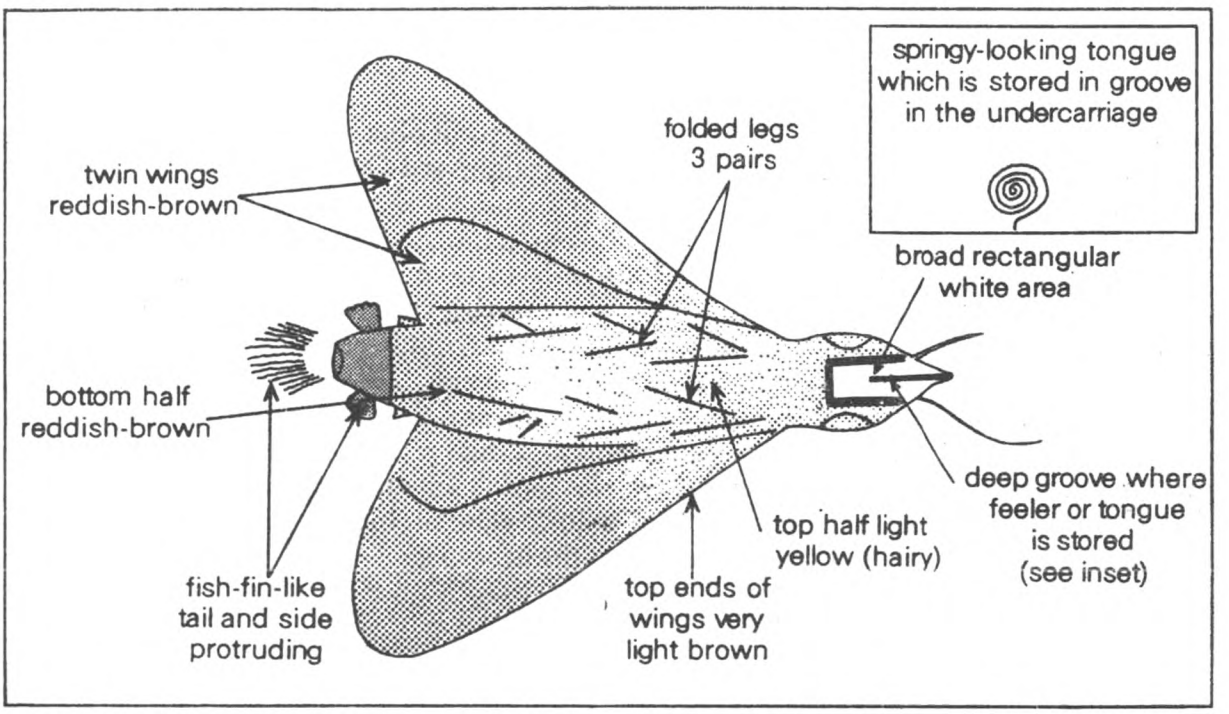
4 July 1975. At 0300 GMT an insect resembling a moth was seen to be flying about in the wheel-house. The observers were unable to take a close look at the insect as it kept flying around. Moreover, no one wished to risk the possibility of being stung. In order to learn more about the insect, a small dose of insecticide was administered.

The most interesting point about it was its spring-like tongue underneath the snout and a very prominent groove running fore and aft, in which the tongue was stored (see drawings). The tail end fanned out like a fish fin, and a fish-fin-like protrusion was observed on either side of the body. The tail and protrusions, it was thought, enabled the insect to maintain stability in flight. It had twin wings and looked very much like a Harrier aircraft in flight.

Position of ship: 32° 29′N, 133° 32′E.


VIEW FROM ABOVE
antenna dark brown 0·9 cm
broken antenna
very sharp pointed snout
leg dark brown 1·5 cm
white band from snout to neck of 0·1 cm thickness
4 yellow circular patches
dark brown band of 0·12 cm thickness
maximum width 0·82 cm
pattern on wing dark brown of 0·12 cm thickness
six square dark brown patches
clearly visible wing veins
two white rectangular patches
dark brown band of 0·3 cm thickness

Length of snout to tail edge 3·67 cm	Mostly a very light off-brown colour
Wing span at rest 3·67cm	with darker super-impressions
Wing tip to snout 3·5 cm	skin appeared to be hairy in texture


springy-looking tongue which is stored in groove in the undercarriage
folded legs 3 pairs
twin wings reddish-brown
broad rectangular white area
bottom half reddish-brown
deep groove where feeler or tongue is stored (see inset)
top half light yellow (hairy)
fish-fin-like tail and side protruding
top ends of wings very light brown

Note. Mr A. H. Hayes of the Department of Entomology, British Museum (Natural History), comments:

'This is *Macroglossum pyrrhostica* Butler, of the moth family Sphingdae. It is a relative of our humming-bird hawk-moth. This species is found from north India to Japan eastwards to Lombok, Indonesia.'

LUMINESCENCE

English Channel

m.v. *Eagle*. Captain J. Robinson. Southampton to Lisbon. Observers, Mr D. Ray and Mr J. Reeves, 2nd Officers.

5 July 1975. At 2215 GMT an unusual luminescence was observed in the water on both sides of the ship besides the more common light-green hue of the bow wave. Initially it was thought we were passing through a large shoal of mackerel or other fish and these were disturbing luminescence in the sea.

On either side of the ship for a distance of at least 60 m there appeared to be many thousands of dots of light each with a tail judged to be from 2 to 15 cm long, in the vague shape of a tadpole or fish and swimming rapidly in all directions away from the ship, some crossing each other and a few even turning complete circles. An attempt was made to see something with the Aldis lamp but to no avail. Occasionally one could see ahead a patch of light 3–6 cm across, which, on the near approach of the ship i.e. 15–30 m away, would suddenly burst out into a seething mass of light, this being similar to the bursting of a firework, as the fish swam out and away. Air temp. 15°C, sea temp. 19°. Wind ENE, force 2–3. Ship's speed 21 knots.

Position of ship: 49° 12′N, 4° 24′W.

Note. Dr P. J. Herring of the Institute of Oceanographic Sciences comments:

'This report is particularly interesting and the officers are undoubtedly correct in their interpretation of the sighting as a large shoal of small fish in water containing a dinoflagellate "bloom". You may perhaps be interested to know that efforts are currently being made both in the northern Atlantic and off South Africa to identify fish shoals and make some estimate of their size by noting the degree of luminescence caused in certain areas by the shoals. Such observations are made at night from low-flying aircraft equipped with image intensifiers, and show some commercial promise.'

(*Opposite page* 116)

Radio Room of a liner in 1912. Photo by Marconi International Marine Company

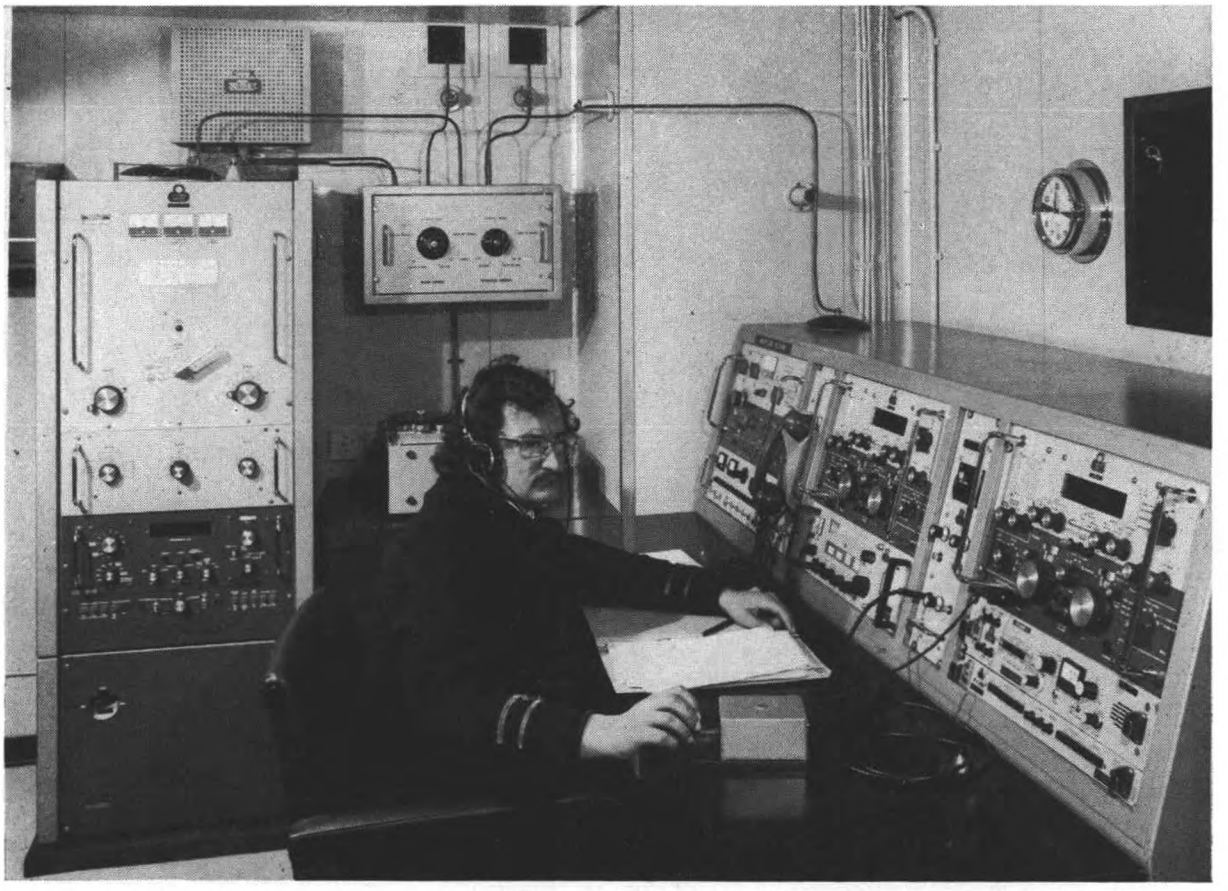


Photo by Marconi International Marine Company

Radio Room of a modern cargo vessel (*see* page 127).

(*Opposite page 117*)

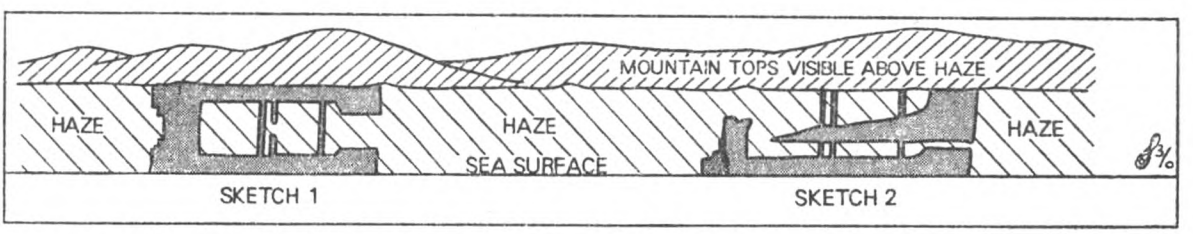
The barograph presentation at Bracknell on 3 February 1976; left to right: Captain R. Hannah, Captain M. J. Heron, Captain G. B. Hannaford, Captain and Mrs D. S. Millard, Mr J. K. Bannon and Captain and Mrs A. F. Ashton (*see* page 128).

ABNORMAL REFRACTION

South Atlantic Ocean

m.v. *City of Capetown*. Captain G. H. Salter. Beira to Rotterdam. Observers, the Master, Mr M. S. Shakespeare, 3rd Officer and Cadet.

28 September 1975. At 1048 GMT unusual inverted refraction was observed off Cape Town (see sketch 1). The phenomenon was observed for about 15 minutes when a distortion of the refracted image occurred (see sketch 2). This lasted for



about another 15 minutes after which the image had merged with the ship. The weather details were as follows: barometer reading 1014·7 mb, dry bulb 18·0°C, wet bulb 15·6, wind SSE, force 2, rippled sea, low swell.

Position of ship: 33° 58′S, 17° 57′E.

METEORS

North Atlantic Ocean

s.s. *Oronsay*. Captain J. A. Lefevre. Bermuda to Port Everglades. Observers, Mr R. Pinchen, 3rd Officer and Mr F. McKeeman, Coxswain.

12 August 1975. An unusually large number of meteors was observed between 0300 and 0730 GMT; the shower was also unusual in that a large variety of meteors was observed. Most of them were of short flight-duration and moving quite fast, others were fainter and moving very fast indeed.

They all seemed to originate in an area close to the Square of Pegasus, all that is but one, a very bright meteor close to the star Fomalhaut on a bearing of about 200°T and at an altitude of about 30°. It moved quite slowly burning with a yellow light, which, at its brightest, was comparable with that of Jupiter fairly close by. It finally burned out, turning slightly orange as it did so, on a bearing of 175°T and at an altitude of 5°. The meteor was observed for approximately 1½ seconds. A trail was not observed.

Position of ship at 0600: 29° 13′N, 70° 38′W.

551.509.61:551.515.2

Project Stormfury

HURRICANES—CAN THEIR DESTRUCTIVE FORCE BE REDUCED?

(This article is reproduced from the *Mariners Log* Vol. 19, No. 5, September 1975, by kind permission of the Editor.)

Project Stormfury was formed in 1962 as a co-operative venture of the Department of Commerce and the Department of Defense. Its objective is to investigate ways for man to alter tropical cyclones beneficially. The organization has changed during the past few years, and the project is now basically a National Oceanic and Atmospheric Administration (NOAA) program.

The general name of the family of storms which includes hurricanes is tropical cyclones. Members of this family are called tropical depressions, tropical storms, cyclones, hurricanes and typhoons, depending on their strength and location. These storms are convectively driven low-pressure systems whose winds flow counter-clockwise around the storm in the northern hemisphere and clockwise in the southern hemisphere. Their wind speeds generally increase inwards towards the storm centre. In relatively mature storms, a band of clouds is formed, called the eyewall, which encircles the centre of the circulation, with an average radius of 10 to 15 n. mile from the storm centre. The wind speeds usually reach their maximum strength in the region of the eyewall and become relatively calm in the nearly cloud-free eye. These maximum wind speeds can exceed 175 kn. The centre of a mature storm, especially at middle and upper levels, is much warmer, and has a much lower surface pressure, than the exterior portions. Figure 1 shows an artist's conception of a hurricane with a pie-shaped section cut away all the way into the eye.

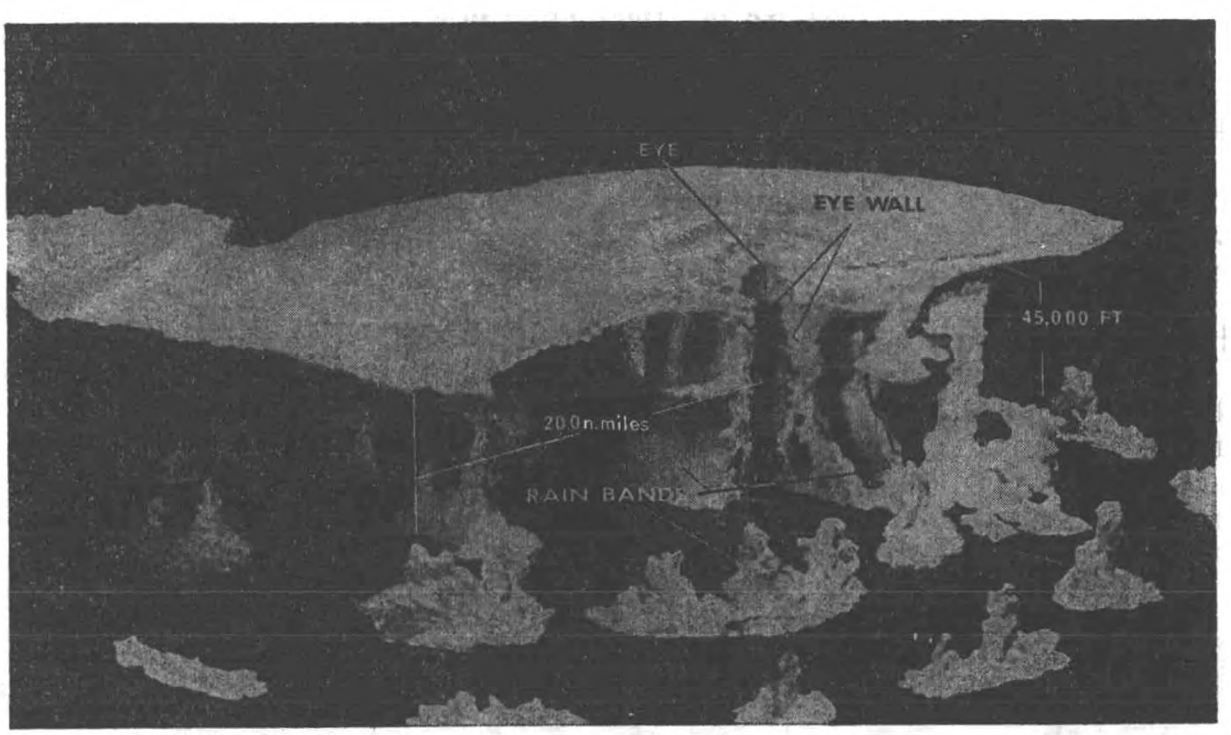


Figure 1. An artist's conception of a hurricane. A pie-shaped section has been cut away all the way into the eye. The vertical scale has been enlarged by a factor of about 10 compared to the horizontal scale. The eye, rainbands and cirrus shield are illustrated.

The losses caused by a single hurricane, typhoon, or cyclone can be large enough to determine the success or failure of some nation's economy. The average annual cost of hurricane damage to the United States alone is now about $450 million. Hurricanes Betsy (1965) and Camille (1969) caused more than $1·4 billion damage each (Gentry, 1974). The loss of property is of course only part of the picture. Other losses, such as loss of business, increased material and food costs due to a loss of productivity, increased shipping costs etc., would increase these numbers to even greater proportions. These factors do not include the loss of human life. The damages resulting from hurricanes are basically caused by the wind, storm surge and rainfall. Nearly all storms which make landfall cause damage from each of these three factors. However, the relative percentage of damage for each factor varies widely, depending upon the storm and where it comes ashore. For instance, the damage resulting along the Texas coast from hurricane Celia (1970) exceeded $450 million and was mostly caused by wind (Gentry, 1974). On the other hand, the storm surge along the Gulf Coast during the passage of hurricane Camille in 1969 reached 7·6 m in some locations (Simpson, 1970) and accounted for much of the damage. Finally, the torrential rains associated with hurricane Fifi (1974) caused inland floods and mudslides in Honduras resulting in the deaths of from 3000 to 10 000 people (Hope, 1975).

The strength of the storm, its speed and direction of movement and its associated rainfall pattern, all play important roles in determining the damage caused by a given storm. The rainfall and storm-surge height are dependent upon the strength of the storm, its speed of movement and the local topography, including the ocean bottom near the coast. The resulting damage is dependent upon these factors, the types of structures and the preparedness of the local residents.

Tropical cyclone damage could be reduced with the proper alteration of the listed storm parameters. Only alterations of the strength of the storm are considered possible in the near future. These alterations would, of course, change the wind speed and possibly the storm surge, but should have no significant effect upon the rainfall.

Project Stormfury experiments are designed to alter the balance of forces in the region surrounding the eye of the tropical cyclone, thus causing a redistribution of the energy concentrated near the storm's centre. A tropical cyclone draws most of its energy from latent heat released during the convective overturning of the atmosphere. At low levels, warm moist air spirals over the tropical sea towards the storm's centre carrying copious quantities of latent and sensible heat. As this air flows into the storm, it acquires some additional energy from the ocean. Most of this air flows upwards through the eyewall and/or into the surrounding rain-band clouds. The inflowing air releases latent heat by forming water droplets and ice particles in the clouds, and thus furnishes most of the energy for driving the storm. The air, slowly turning as a result of the rotation of the Earth, gathers tangential speed through partial conservation of its absolute angular momentum during its slow inward spiral. This process produces increasingly stronger winds as the air gets progressively closer to the storm's centre, until the air flows upwards and then away from the storm's core at high levels. A process which would cause this low-level, moisture-laden air to rise at a greater distance from the storm centre than would naturally occur would produce a reduction in the wind speeds. It would also cause a change in the thermal structure of the storm, since there would be an increase in the rate of latent-heat release in the new region of ascending air motion and a decrease in the region where the air formerly rose. The question then is how to alter the mass flow in the hurricane.

Radar observations in hurricanes containing a well-formed eyewall indicate that many of the areas located outward from the eyewall, away from the storm centre, contain clouds that do not extend to the outflow level. Other observations indicate that most of these clouds contain large quantities of supercooled liquid water (water with a temperature lower than 0°C). Numerical calculations based upon buoyancy

indicate that these clouds can be caused to grow through the dynamic seeding process. Injection of silver iodide particles (which appear to the cloud to be ice particles) into these clouds causes the droplets to freeze, releasing the latent heat of fusion (335 kJ/kg). This additional heat increases the buoyancy of that portion of the cloud (causes that portion of the cloud to be warmer and therefore lighter than the surrounding air) and thus triggers an increase in the ascending flow. As the air rises it expands and cools and water vapour condenses or sublimates (forms water droplets or ice particles), releasing considerably more latent heat (2512 kJ/kg). The result is that the seeded clouds grow to the outflow level and thus provide new convective conduits which intercept the inflowing moisture-laden air near the surface, causing it to rise to the outflow layer and be carried away from the core of the storm. This increased heating in the seeded clouds on the exterior edge of the eyewall, along with the decreased fuel supply for the old eyewall, also results in diminished horizontal temperature gradients. The reduction in wind speeds follows naturally from this sequence of events. That is, air flowing inwards and accelerating because of the partial conservation of angular momentum ascends in this new convective area before it reaches the tangential speeds that it would have achieved had it continued to spiral into the old eyewall.

In summary, the Stormfury hypothesis is as follows.

(*a*) Clouds are seeded outwards (away from the storm centre) from the external edge of a mature hurricane eyewall.
(*b*) The supercooled water in the seeded cloud freezes, latent heat of fusion is released, the buoyancy of the upper portion of the cloud increases, and increased ascent results in increased condensation rates and cloud growth.
(*c*) The seeded cloud reaches the outflow level, providing a conduit for the major vertical mass transport at a larger radius.
(*d*) The old eyewall circulation weakens as the vertical mass transport is concentrated in the seeded clouds, and the subsidence in the eye decreases.
(*e*) The maximum wind speeds are reduced owing to the partial conservation of angular momentum and the decreased temperature gradients.
(*f*) The pressure field adjusts to the wind and temperature fields.
(*g*) Finally, the storm starts to return to its natural state as determined by the synoptic-scale environment (atmospheric and oceanic conditions surrounding the hurricane), 6 to 18 hours after the final seeding.

The process just described is schematically illustrated in Figure 2, which shows a vertical cross-section through the centre of a storm. The upper panel shows the storm prior to seeding, and the lower panel illustrates the hypothesized alterations in the translational flow and cloud structure.

The hurricane modification research, including simulations by numerical models, and the field experiments conducted in previous years suggest that the maximum winds in hurricanes can be reduced by 10 to 20 per cent when the proper clouds of the storms are seeded with freezing nuclei. This doesn't sound like much of an effect. However, the force exerted by the wind varies with the square of the wind speed; therefore, a reduction of 10 to 20 per cent in the maximum wind speeds will result in a reduction of 19 to 36 per cent in the maximum force of the winds. The wind damage could be reduced by at least an equal amount. Research relating damage to wind speed suggests that the damage would be reduced by an even higher percentage. The storm surge is a function of several parameters, but the principal influences are the sustained wind speed and the slope of the ocean's bottom. This suggests that, in most cases, reducing the maximum wind speeds should also reduce the storm surge. Therefore, if the maximum surface wind speeds can be reduced by only 10 to 15 per cent, the hurricane damage in the United States could be reduced by $50 to $100 million per year, and lives might be saved in areas that are difficult to evacuate.

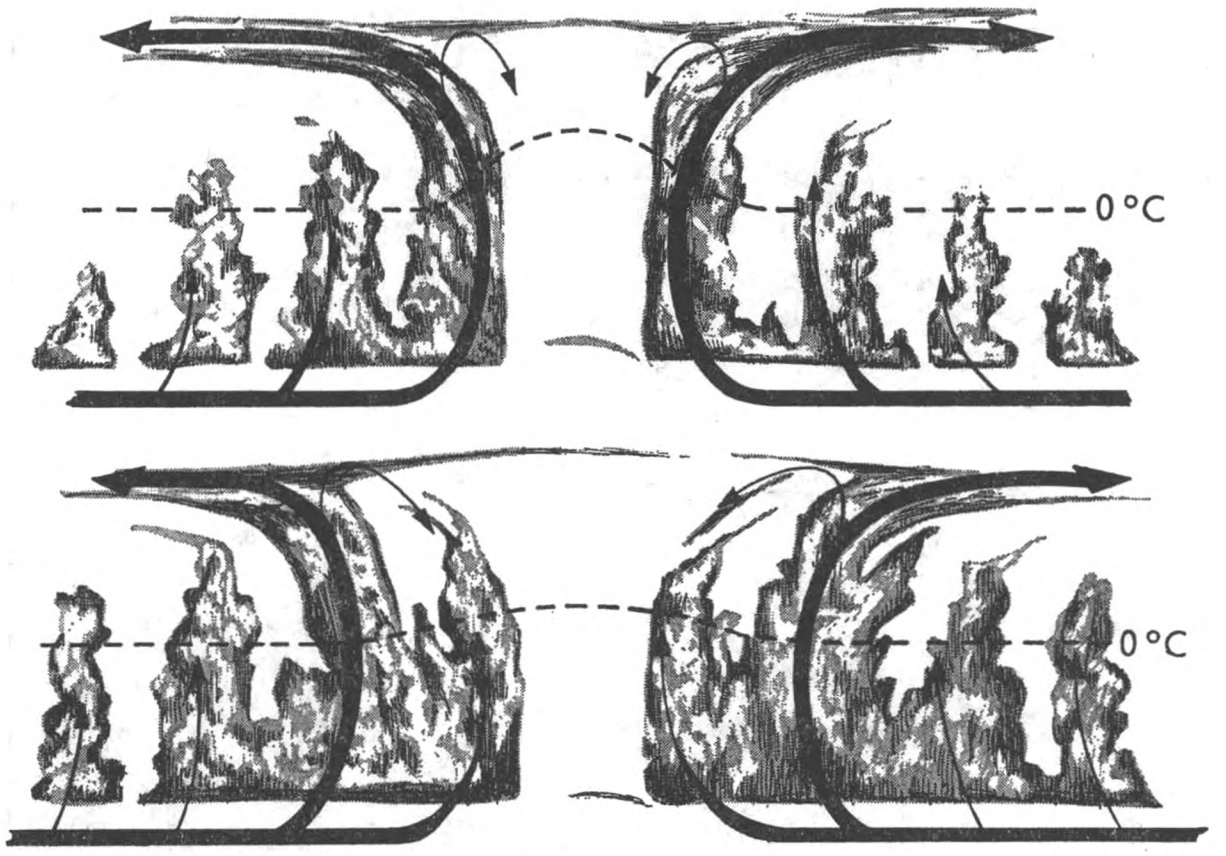


Figure 2. Schematic illustration of the hypothesized convective structure and translational flow through a storm before (top) and after (bottom) the seeding effect starts taking place.

Four hurricanes have been seeded since 1961 (Figure 3)—hurricane Esther (1961), hurricane Beulah (1963), hurricane Debbie (1969), and hurricane Ginger (1971). All of these cases except Ginger involved seeding in or near the eyewall. In all but one of these cases there were indications of a reduction in wind speed. In no case was there an indication of a wind-speed increase. However, only the two hurricane Debbie experiments were conducted in a manner closely resembling the present Stormfury hypothesis. The hurricane Ginger rain-sector seeding experiments, on September 26 and 28, 1971, were performed on a poorly defined, diffuse storm. This makes direct comparison with results obtained in hurricane Debbie impossible, although some modifications to the clouds in Ginger did occur as a result of the seeding.

Hurricane Debbie (1969) was seeded five times on each of two different days. The maximum wind speeds decreased by approximately 30 per cent on August 18, and 15 per cent on August 20 (Figures 4 and 5). There is evidence other than the wind speed alone that supports the present Stormfury hypothesis. In fact, the present hypothesis is partially based upon the analysis of the Debbie experiments. For instance, there was a decrease in the middle-level temperature in the eye of Debbie on both the 18th and 20th, and indications of slight increases in temperature outside the eyewall. Also, the water-vapour content in the eye at these same levels increased considerably on both days, possibly indicating a weakening of the circulation set up by the old eyewall. There was also other evidence as depicted by the changing structure of the storm (Sheets, 1973) and in the radar structure (Black, 1972). In summary, although not conclusive, time sequences of the wind, radar and other data suggest that a modification to hurricane Debbie was achieved. However, more such data analyses are required before definitive statistical support can be claimed.

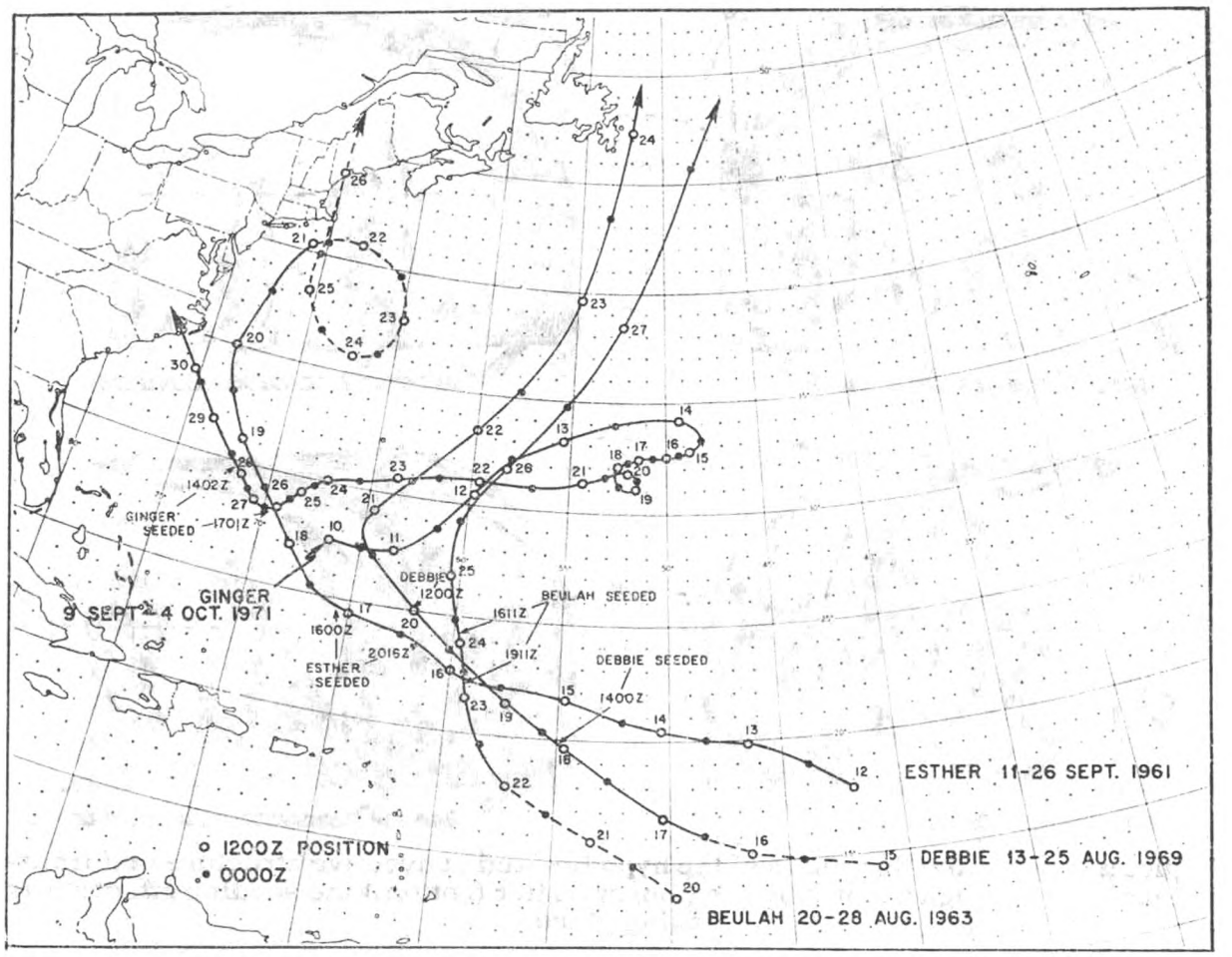


Figure 3. Tracks of all hurricanes which have been seeded 1961-75.
(Times and locations of seeding are indicated.)

The progress of the experimental program and research has continually undergone scientific scrutiny, and periodic symposia have been held. An Advisory Panel consisting of five members from the scientific community provided guidance from 1962 to 1973 on the scientific and technical aspects of the project, and a workshop was conducted in 1974 which involved many prominent scientists in the field of meteorology. These groups recommended increased emphasis on cloud physics, radar, the sequence-of-events approach and the physical analysis (reasoning from cause to effect). The results of the Debbie experiments were so encouraging that increased efforts were urged towards the testing of the Stormfury hypothesis. Also, new instrumentation was being developed which would permit a thorough evaluation of each link in the hypothesis.

To test the Stormfury hypothesis thoroughly, certain critical variables should be measured to determine the following:

(*a*) variation with time of wind, temperature, pressure and radar-echo patterns at various levels and positions over periods of 12 to 30 hours, in both natural and seeded tropical cyclones,

(*b*) availability and extent of potential energy in the form of supercooled water, the distribution of nuclei after seeding and the effectiveness of conversion to ice,

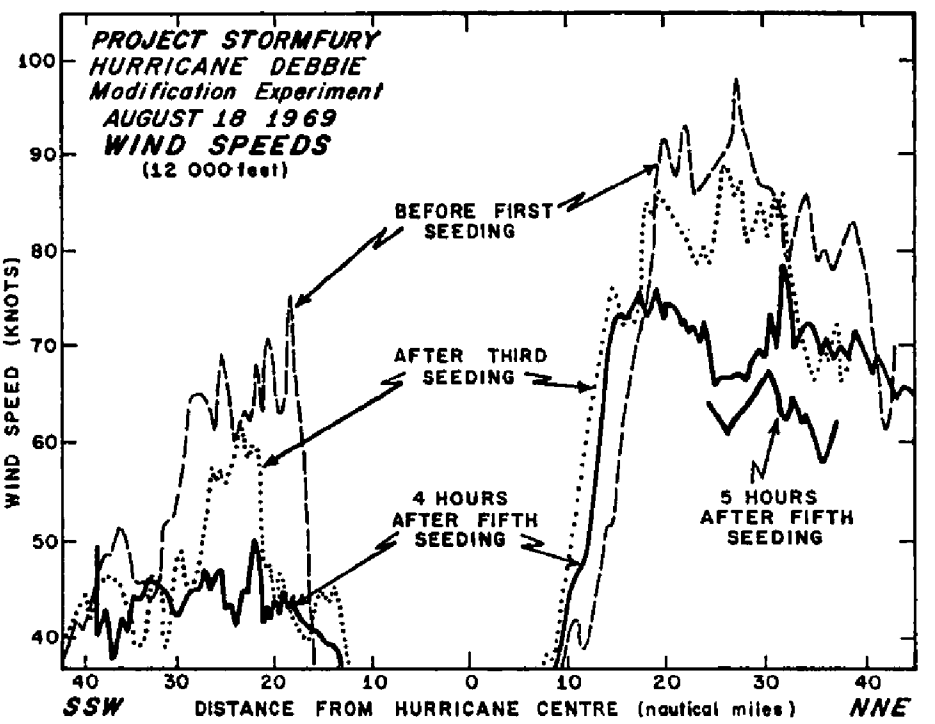
(*c*) variations of sea-surface temperature and momentum flux, the inflow of latent heat in the subcloud layer and other levels of tropical cyclones, and the modification of these parameters due to seeding,

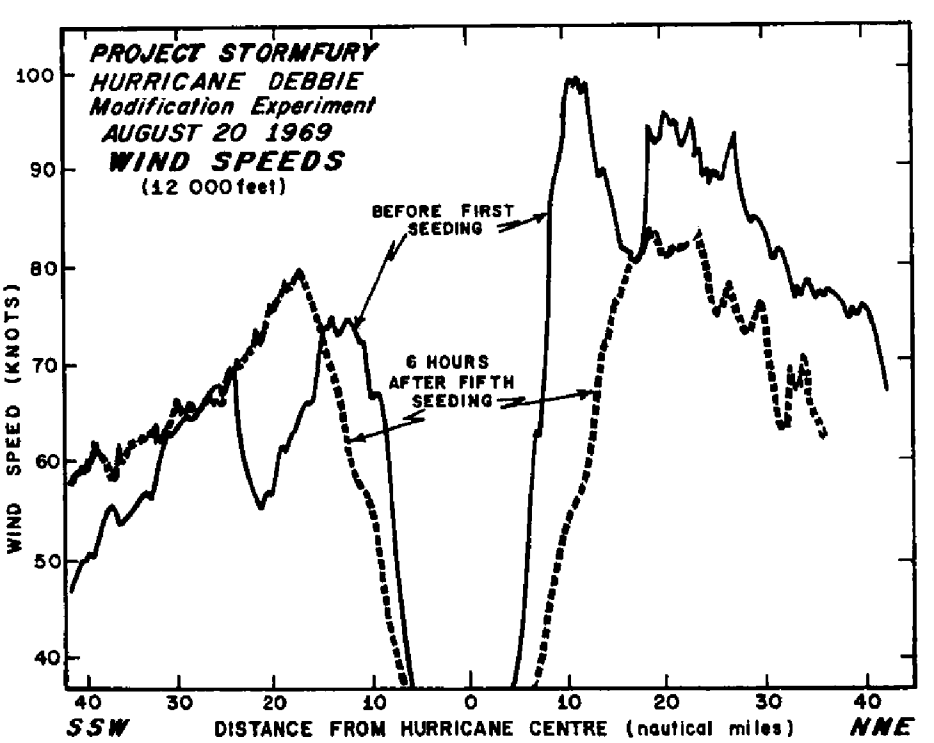
(*d*) large-scale circulations in the upper troposphere that act to maintain or to inhibit the hurricane,

(*e*) surface wind and wave fields, the wave-coupled momentum flux and its relation to total momentum flux, surge-damage potential, and the role of surface waves in the ocean–atmosphere feed-back system,

(*f*) effects of a tropical cyclone on mixing and upwelling of the ocean, and therefore on the sea-surface temperature, and the role of a modified ocean on the dynamics of the cyclone, and

(*g*) parameters of sea-state wave spectra, surface wind and sea-surface temperature that may be measured from aircraft using remote-sensing instrumentation.





Figures 4 and 5. Hurricane Debbie wind-speed profiles recorded on 18 and 20 August 1969.
(after Gentry, 1970)

The probable Stormfury aircraft employment timetable illustrated in Figure 6 should provide the required measurements. This diagram contains inserts illustrating the number of aircraft and crews required, as well as the basic monitoring pattern superimposed upon a simulated radar presentation. The periods of monitoring by each aircraft are indicated by blocks. The small illustrations directly above or below these blocks depict the portion of the basic monitoring pattern covered during that time period.

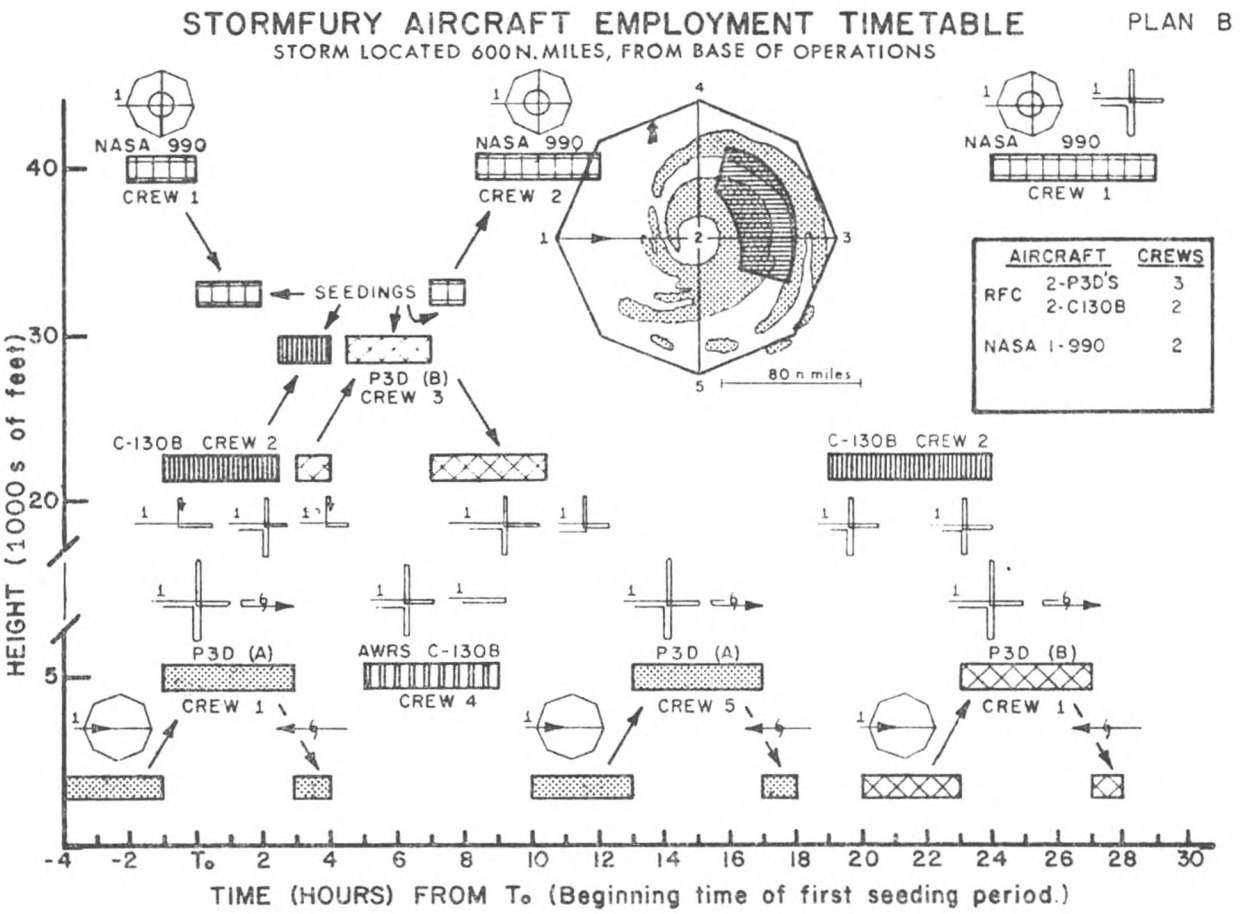


Figure 6. Stormfury aircraft employment timetable.

The goal is to establish a modification hypothesis at a confidence level high enough that the technique can be taken from the experimental stage and used operationally. The attainment of this goal will require monitoring of several seeded and unseeded cases. The likelihood of obtaining a sufficient number of experiments in the near future in the Atlantic is small. Therefore, plans are under way to operate from Guam in the western North Pacific (Figure 7), where it should be possible to obtain approximately five seeded and six unseeded cases each year, during the peak typhoon periods of 1977 and 1978.

Three major questions are raised concerning the effects of the modification upon the storm:

(*a*) what is the chance of increasing the strength of the storm?
(*b*) what is the probability of causing a change in the direction and speed of movement of the storm?
(*c*) what changes in the total precipitation may occur?

All evidence presently available indicates that no significant changes should occur relative to these three facets of the storm. However, the guidelines covering the experiments include additional safeguards.

The most significant safeguard is that no seeding during these experiments will take place during the period of several hours before the storm makes landfall. The Stormfury hypothesis states that the storm returns to its 'natural' state within the period of 6 to 18 hours after the seeding stops. This is based upon theoretical computations and the results of previous experiments. The most complete case is hurricane Debbie, which underwent a very distinctive decrease in intensity on August 18 (Figure 4), and had returned to nearly its original state by early on the 20th (Figure 5).

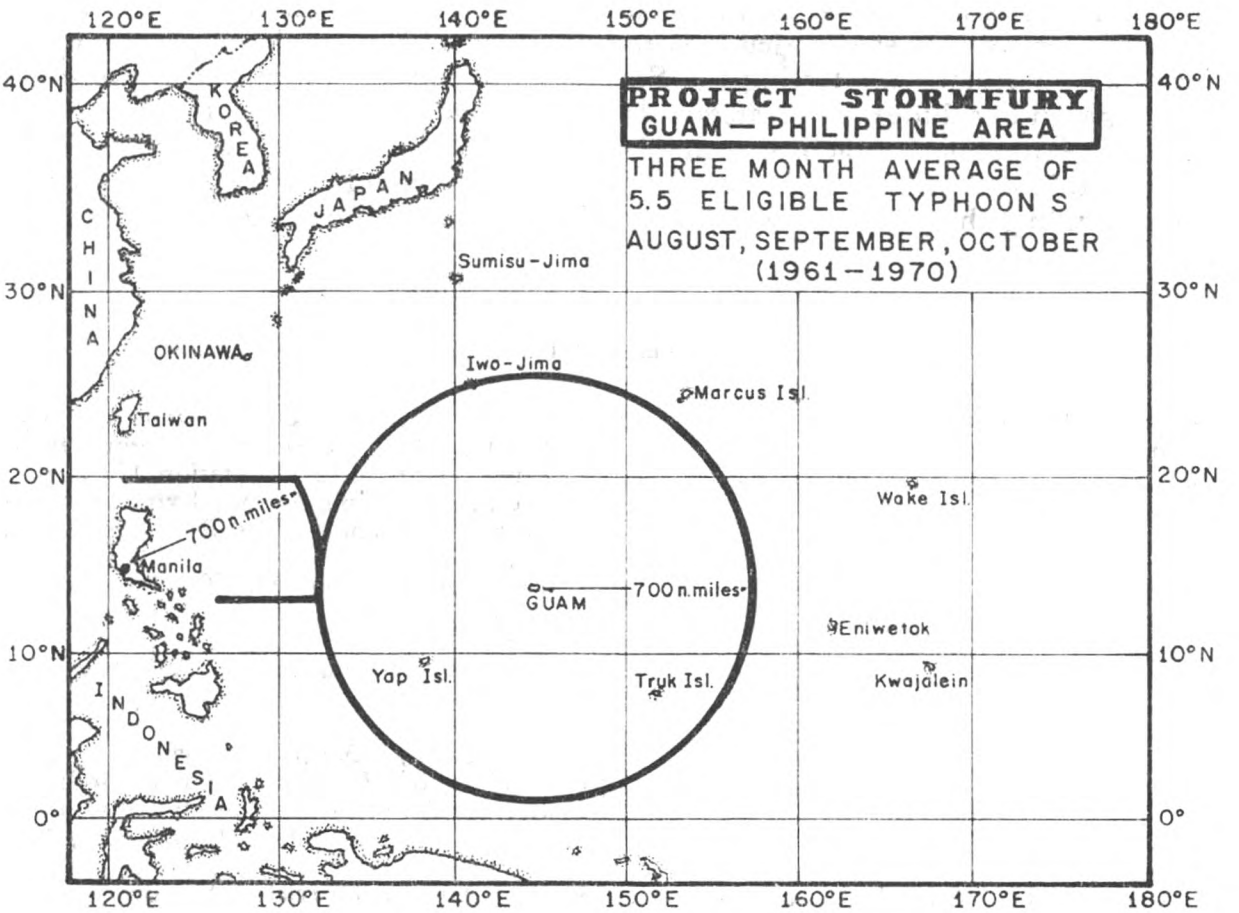


Figure 7. Scheduled area (circle) of Stormfury Pacific experiments.

The question of the alteration of rainfall is of concern to some nations. It is believed that the total rainfall associated with a hurricane is basically a function of the synoptic-scale environment. Figure 2 illustrates the hypothesized change in the convective pattern. The primary change is an alteration of the inner core of the storm. Calculations, primarily based upon actual radar observations, indicate that changes of rainfall rates of as much as 30 per cent in the inner core have little net effect on the total accumulated rainfall from the storm as it passes over a given area. Finally, the fact that hurricane Debbie exhibited a typical radar structure at the beginning of both the August 18 and 20 experiments is further evidence that there were no significant long-term effects on the precipitation associated with this storm.

The movement of the storm is also believed to be a function of the synoptic-scale environment, rather than the smaller-scale motions hypothesized to be affected by the seeding. Several calculations and a numerical experiment are presently being made to demonstrate the possible effects on the hurricane movement of seeding in an asymmetric fashion. However, most storms are asymmetric and their movement is as predictable as more symmetric cases. Furthermore, diffusion calculations indicate that materials dispersed in the fashion prescribed by the present hypothesis

are rapidly spread around the storm. In all the cases illustrated in Figure 3, including the two hurricane Debbie experiments, there were no apparent alterations in the track during, or immediately after, the seeding.

The final question is that of intensity. This is the area where the strongest evidence exists that no detrimental effects take place as a result of the seeding. In all seeded cases, no storm increased in strength during the monitoring period after seeding. Furthermore, the simulations by numerical models indicate that no increase will result if the seeding takes place as specified by the present hypothesis.

All evidence presently available indicate that the scheme described in the Stormfury hypothesis may provide a means of decreasing the destructive force of hurricanes. Therefore, it seems that this technique should be explored as rapidly as possible. The plans for testing the Stormfury hypothesis during 1978 are quite thorough and include many safeguards during this testing phase. By the end of these experiments, a practical technology may have been attained for beneficial modification of hurricanes, and a new plateau will certainly have been reached in understanding the processes which maintain and drive a hurricane.

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75 YEARS OF MARITIME SERVICE*

1901–76

Seventy-six years ago, Guglielmo Marconi formed the Marconi International Marine Company on the very day that he celebrated his own 26th birthday—25 April 1900. The object of the Company was to enable shipowners to rent wireless apparatus, the services of operators and the use of Marconi shore stations, so ending the isolation of those at sea. The services still operate today, though the shore stations are now under Post Office control.

In 1901, the year of his dramatic bridging of the Atlantic with Morse code transmissions, Marconi started to establish a network of permanent wireless stations specifically for maritime communications. Stations were built that year on the British and Irish coasts and in Belgium and Germany, while US stations on the Nantucket lightship and at Siasconcet were made available, and a station at Belle Isle in the Gulf of St Lawrence was nearing completion.

By the end of 1901, not only had the British and Italian navies adopted the 'new device' but so too had the first British merchant ship, a number of foreign merchant ships, and the Cunard liners *Lucania* and *Campania*.

The value of Marconi's invention as a life-saver was established beyond question in 1909 when the wireless-equipped White Star liner *Republic* collided with the Italian s.s. *Florida*. Before long, ships were converging on the scene in response to the wireless distress signals. For his devotion to duty during the traumatic experience, the Marconi Radio Operator, Jack Binns, assured himself of a place in the annals of maritime history.

During the first decade of the Company's life, the number of wireless-carrying ships increased steadily, but it was the part that wireless played in the arrest of the notorious murderer, Dr Crippen, that supplied the drama. Captain Kendall of the *Montrose*, suspecting that Dr Crippen and his mistress, Ethel le Neve, were aboard his ship bound for Canada, signalled Scotland Yard by wireless, and on arrival in Canada, they were taken into custody by fast-travelling Inspector Dew of the Yard.

In 1912 came the tragic *Titanic* disaster. Those who survived owed their lives to wireless and to the devotion and bravery of the Marconi Marine radio officers, one of whom, 'Jack' Phillips, died at his post.

During the First World War, the Company trained 3300 operators for mercantile marine service, and 180 of its own radio operators lost their lives at sea. As often happens in time of war, technological progress hotted up. Radio direction-finding was brought to a fine art, and the range of a ship's wireless-telegraphy station was increased to between 2000 and 3000 n. mile. Wireless telephony too made headway, culminating in a large-scale demonstration in 1920, when delegates of the Empire Press Union on board s.s. *Victorian* held wireless-telephone conversations over distances in excess of 1000 n. mile. The new Marconi direction-finder was also demonstrated on this voyage, and within six years was adopted by over 200 ships. Another war-time development to go into wide use was the Marconi auto-alarm which, unlike many wireless devices, actually enabled some shipowners to cut down on expenses, as it performed the task of two wireless watch-keepers—formerly mandatory on certain ships.

The '20s also saw the introduction of sound-reproducing equipment on board ships, and the 'Marconi Band Repeater', through its microphone, amplifier and loudspeakers, brought live gramophone music to entertain those at sea.

Meanwhile, the fishing industry had not been slow to follow the example of the deep-sea vessels, and by the late '20s, 191 trawlers and drifters carried Company

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* This article is reproduced from the Marconi publication *Aerial* (Summer 1975) with the kind permission of the Editor.

equipment. By 1930, the newly developed Marconi echo-meter was bringing valuable underwater information, including fish locations, to trawlermen, as does its descendant today, the echo-sounder.

Two years after Guglielmo Marconi's death in 1937, Marconi Marine was again heavily committed to war work, providing radio personnel for the British Merchant Navy and equipment for both British and allied shipping, and moving service depots along the line of battle for the benefit of ships coming into port.

After the war, Marconi Marine decided to direct the radar experience gained by the Marconi Company to the design of completely new equipment for peacetime shipping. In 1946, the first 'Radio Locator' went on exhibition and a radar school was established in Chelmsford to train both shore and sea staff.

In its Jubilee year, 1950, the Company received orders for re-equipping all the lighthouses and radio beacons round the coast of Britain. In the following year it supplemented the already comprehensive Marconi Marine installation on the *Gothic* which, as the floating headquarters for the Commonwealth tour of the Queen and the Duke of Edinburgh, had to meet excessive communication demands. Notable in the '50s was the increasing use of VHF for maritime purposes. The Company was ready to meet the demand with a new range of equipment, exploiting, in the late years of that decade, the advantages of the single side-band mode of operation, which has led directly to Omega, automatic Loran, selective calling and automatic error-correcting systems that ensure accurate telex communication.

In the mid '60s a vast new market for Marconi Marine opened up with the arrival of the first North Sea drilling rig. Over the years requirements have advanced from simple radio-telephone links with the shore to specially designed independent side-band (i.s.b.) equipment providing simultaneous radio-telephony and teleprinter transmission.

1970 saw another piece of history being made when Dallas Bradshaw of Marconi Marine became the first woman radio officer to go to sea in the British Merchant Navy. The '70s have also seen the introduction of Marconi Marine electronics officers and the expanding use of the Company's equipment, which include a variety of on-board entertainment systems and the spectacular, fully automatic anti-collision radar, 'Predictor'.

Since 1900, the Company has led the way in marine electronics. A Queen's Award winner for export achievement, it offers to ships of all nationalities the widest range of electronic equipment available from any one company.

PRESENTATION OF BAROGRAPHS

The Annual Barograph Awards were made on 3 February 1976 to 3 of the 4 shipmasters who qualified for the period ending in the year 1974.

Once again we were unable to secure the presence of all 4 recipients on the same date, leaving one Award outstanding, that to Captain J. M. Burn of P & O General Cargo Division. At the time of writing Captain Burn is in command of m.v. *Taupo* on her way home from New Zealand and we are extremely hopeful of obtaining the presence of Captain Burn in March or April to present him with his well-deserved Award.

It would have been unusual had we obtained the presence of all 4 masters at the same time; only once since the introduction of these Awards in 1948 has this been possible.

These Awards are allotted for long service (15 years and upwards), continuity of records and the general outstanding quality of these records, bearing in mind that the work is completely voluntary.

The 3 masters able to attend this first presentation, whose names appeared in the April issue of *The Marine Observer* were Captain M. J. Heron, Container Fleets, Captain D. S. Millard, Manchester Liners and Captain A. F. Ashton, Bibby Brothers and Company. It also gave us great pleasure to have with us the wives of 2 of the masters, Mrs Millard and Mrs Ashton, and in addition Captain G. B. Hannaford, Marine Superintendent (Personnel), Manchester Liners, and Captain R. Hannah, Operating Manager, Container Fleets.

The presentations were again made by Mr J. K. Bannon, Director of Services of the Meteorological Office. Mr Bannon thanked the 3 shipmasters, together and individually, whilst making the presentations, and emphasized the great value and significance, over the past years, of observations received from merchant ships, and of their continued vital importance for the future.

During the presentation the masters' first meteorological records and record cards were on display for their perusal, which undoubtedly recalled some nostalgia for former less-demanding voyages spent at sea.

The party then retired to luncheon with Mr Bannon and senior officers of the Meteorological Office. After lunch the visitors were escorted around the Central Forecasting Office, the Telecommunication Centre and the Computer Laboratory.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM JANUARY TO MARCH 1976

The charts on pages 132 to 134 display the actual and normal ice edges (4/10 cover), sea-surface and air temperatures and surface-pressure anomalies (departures from the mean) so that the abnormality of any month may be readily observed. (The wind anomaly bears the same relationship to lines of equal pressure anomaly as wind does to isobars. Buys Ballot's law can therefore be applied to determine the direction of the wind anomaly.) Southern and eastern iceberg limits will be displayed during the iceberg season (roughly February to July). In any month when sightings have been abnormally frequent (or infrequent) this will be discussed briefly in the text.

The periods used for the normals are as follows. Ice: 1966–73 (Meteorological Office). Surface pressure: 1951–70 (Meteorological Office). Air temperature: 1951–60 (U.S. Department of Commerce, 1965). Sea-surface temperature: area north of 68°N, 1854–1914 and 1920–50 (Meteorological Office, 1966), area south of 68°N, 1854–1958 (U.S. Navy, 1967).

JANUARY

The anomalies of pressure and air temperature were less marked than during December 1975; the main anomalies in the vicinity of the ice edge were for south-easterly winds and lower-than-average air temperatures over the White Sea and the southern part of the Barents Sea. Here an excess of ice developed. Elsewhere excesses and deficits of ice persisted through the month in much the same areas as at the end of December 1975.

FEBRUARY

Over the Barents Sea ice fields drifted to the east and south-east on account of the anomaly for milder westerly winds which soon replaced the cold south-easterly winds of the previous month. Between Spitsbergen and Novaya Zemlya the ice edge approached the position that is normal for the time of year but in the southern Barents Sea the ice receded during February—a month during which the ice field normally extends considerably in this area. In the Baltic anomalous winds from the south-west gave temperatures rather above average and delayed the normal southwards extension of ice although there was a persistence of fast ice along the coast of Sweden. Over the Greenland Sea and Denmark Strait a strong anomaly for south-westerly winds resulted in some recession and restricted the normal spread of ice north of Jan Mayen so that by the end of the month there was a substantial deficit there. Prolonged and cold north-westerly winds along the west coast of Greenland caused rapid freezing and an unusual excess of ice. Off the coasts of Labrador and Newfoundland the ice edge moved eastwards ahead of normal with an anomaly for cold westerly winds. The ice consolidated in the Gulf of St Lawrence and a tongue of pack ice extended through Cabot Strait and as far south as 45°N.

MARCH

The anomaly patterns for March were much the same as for February, i.e. for cold westerly or north-westerly winds to the west and south of Greenland and for comparatively mild south-westerly or westerly winds over most of the ice fields east of Greenland. Thus in the colder-than-usual areas west of Greenland excesses of ice persisted, with some extension, the most notable excesses by the end of the month being off the west coast of Greenland and north-east of Newfoundland. In the milder-than-usual areas east of Greenland an exceptional deficit of ice developed between Iceland and Jan Mayen and also substantial deficits near Spitsbergen and Novaya Zemlya. Some deficit of ice persisted over the Baltic though temperatures there were a little below average with a slight anomaly for south-easterly winds.

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Baltic Ice Summary: January–March 1976

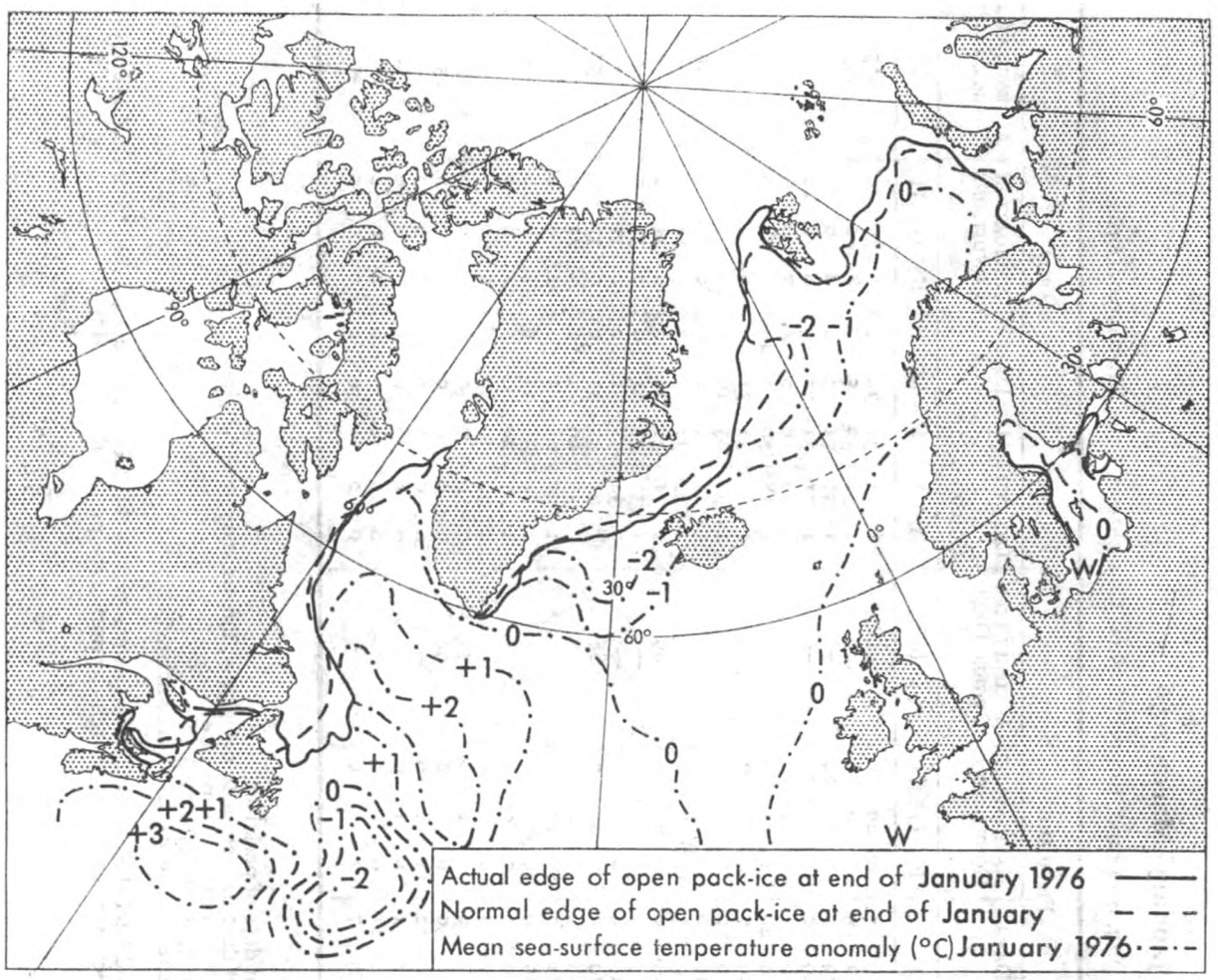
No ice was reported at the following stations during the period: Kiel, Flensburg, Stralsund, Rostock, Aarhus, Copenhagen, Oslo, Kristiansandfjord

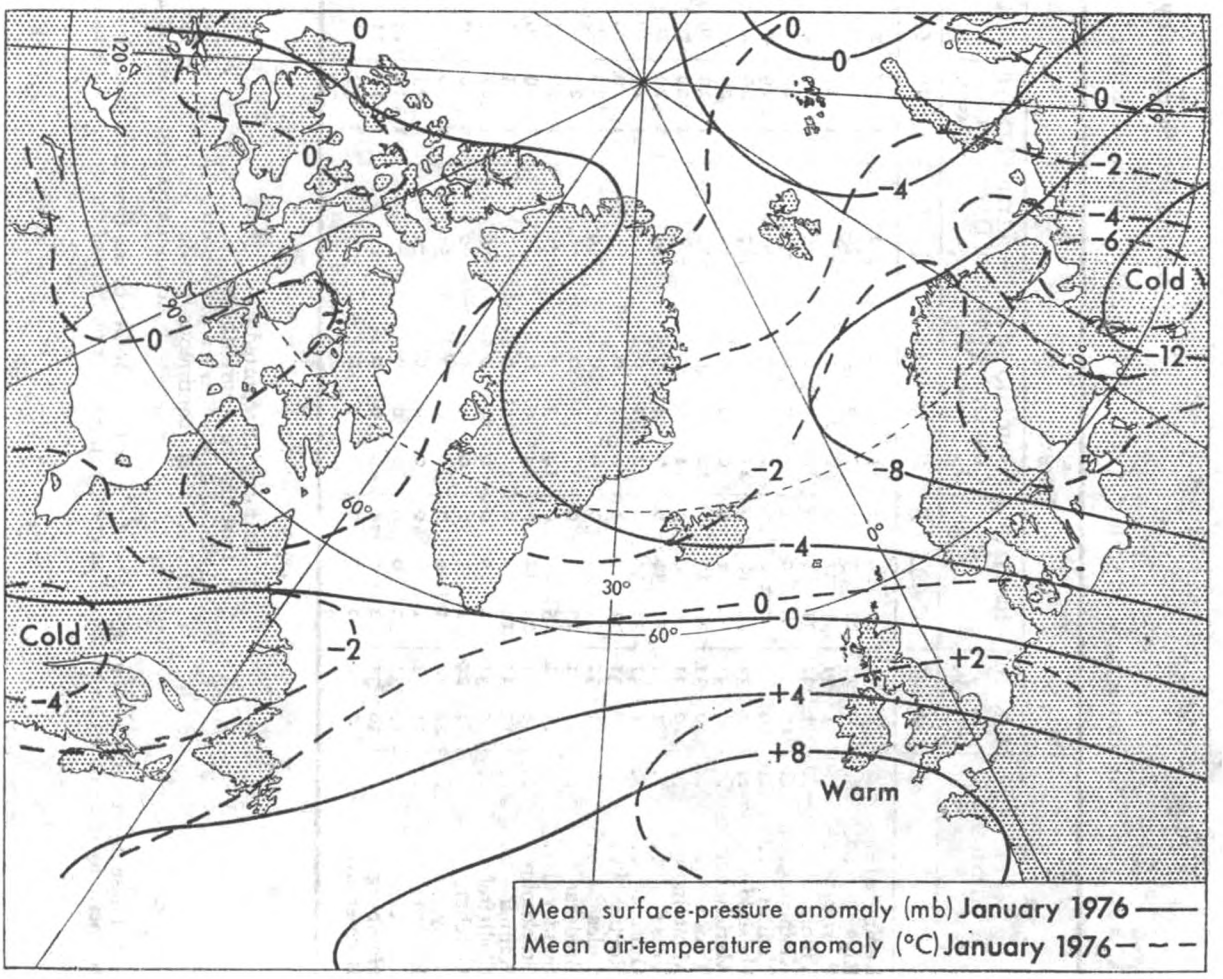
Station	January									February									March								
	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Leningrad	1	31	31	29	2	1	30	0	494	1	29	29	29	0	0	29	0	791	1	31	31	30	1	1	30	0	935
Riga	5	31	22	3	2	7	0	0	178	1	29	29	13	5	25	0	0	346	1	31	30	5	17	28	0	0	425
Pyarnu	1	31	31	31	0	2	29	0	—	1	29	29	29	0	0	10	19	—	1	31	31	31	0	0	0	31	—
Viborg	1	31	31	31	0	0	31	0	—	1	29	29	29	0	0	8	21	—	1	31	31	31	0	0	9	22	—
Klaipeda	17	31	8	0	3	5	0	0	—	1	24	24	0	21	20	0	0	—	8	26	19	0	4	7	0	0	—
Tallinn	19	31	3	0	0	1	0	0	—	1	29	29	0	28	1	29	0	—	1	28	28	0	28	3	28	0	—
Helsinki	4	31	28	18	0	21	6	1	387	1	29	29	29	0	0	29	0	595	1	31	31	31	0	0	31	0	756
Mariehamn	30	31	2	0	0	0	0	0	—	1	29	21	6	0	20	0	0	—	1	31	25	10	0	18	1	0	—
Turku	6	31	26	17	0	12	5	0	312	1	29	29	29	0	0	29	0	464	1	31	31	31	0	0	31	0	626
Mantyluoto	10	31	19	0	0	11	0	0	—	1	29	29	0	7	11	16	0	—	1	31	31	7	2	17	14	0	—
Vaasa	1	31	31	31	0	7	24	0	431	1	29	29	29	0	0	29	0	589	1	31	31	31	0	0	31	0	819
Oulu	1	31	31	31	0	0	31	0	—	1	29	29	29	0	0	29	0	—	1	31	31	31	0	0	31	0	—
Roytaa	1	31	31	7	18	0	31	0	—	1	29	29	25	4	0	29	0	—	1	31	31	31	0	0	31	0	—
Lulea	1	31	31	31	0	6	25	0	754	1	29	29	29	0	0	29	0	988	1	31	31	31	0	0	31	0	1252
Bredskar	1	31	23	8	0	17	5	0	—	2	27	26	18	2	1	28	0	—	2	31	29	5	2	3	27	0	—
Sundsvall	14	31	15	11	0	12	3	0	—	1	27	27	21	0	14	13	0	—	11	31	21	15	0	21	0	0	—
Stockholm	8	31	24	24	0	24	0	0	172	1	29	29	29	0	29	0	0	221	1	31	31	31	0	31	0	0	306
Kalmar	17	31	12	6	0	11	1	0	—	1	23	22	9	0	22	0	0	—	2	27	24	0	0	24	0	0	—
Skellefteå	2	31	30	25	0	10	20	0	—	1	27	27	27	0	0	29	0	—	2	31	30	23	0	0	30	0	—
Göteborg	24	24	1	1	0	0	1	0	60	0	0	0	0	0	0	0	0	72	0	0	0	0	0	0	0	0	121
Visby	24	24	1	0	0	0	0	0	54	0	0	0	0	0	0	0	0	94	0	0	0	0	0	0	0	0	154
Emden	31	31	1	0	0	0	0	0	—	1	13	13	0	12	11	0	0	—	0	0	0	0	0	0	0	0	—
Lübeck	30	31	2	0	0	0	0	0	—	1	14	14	2	1	8	1	0	—	0	0	0	0	0	0	0	0	—
Hamburg	30	31	2	0	1	0	0	0	—	1	11	11	0	11	9	0	0	—	0	0	0	0	0	0	0	0	—
Bremerhaven	0	0	0	0	0	0	0	0	—	2	9	8	0	7	2	0	0	—	0	0	0	0	0	0	0	0	—

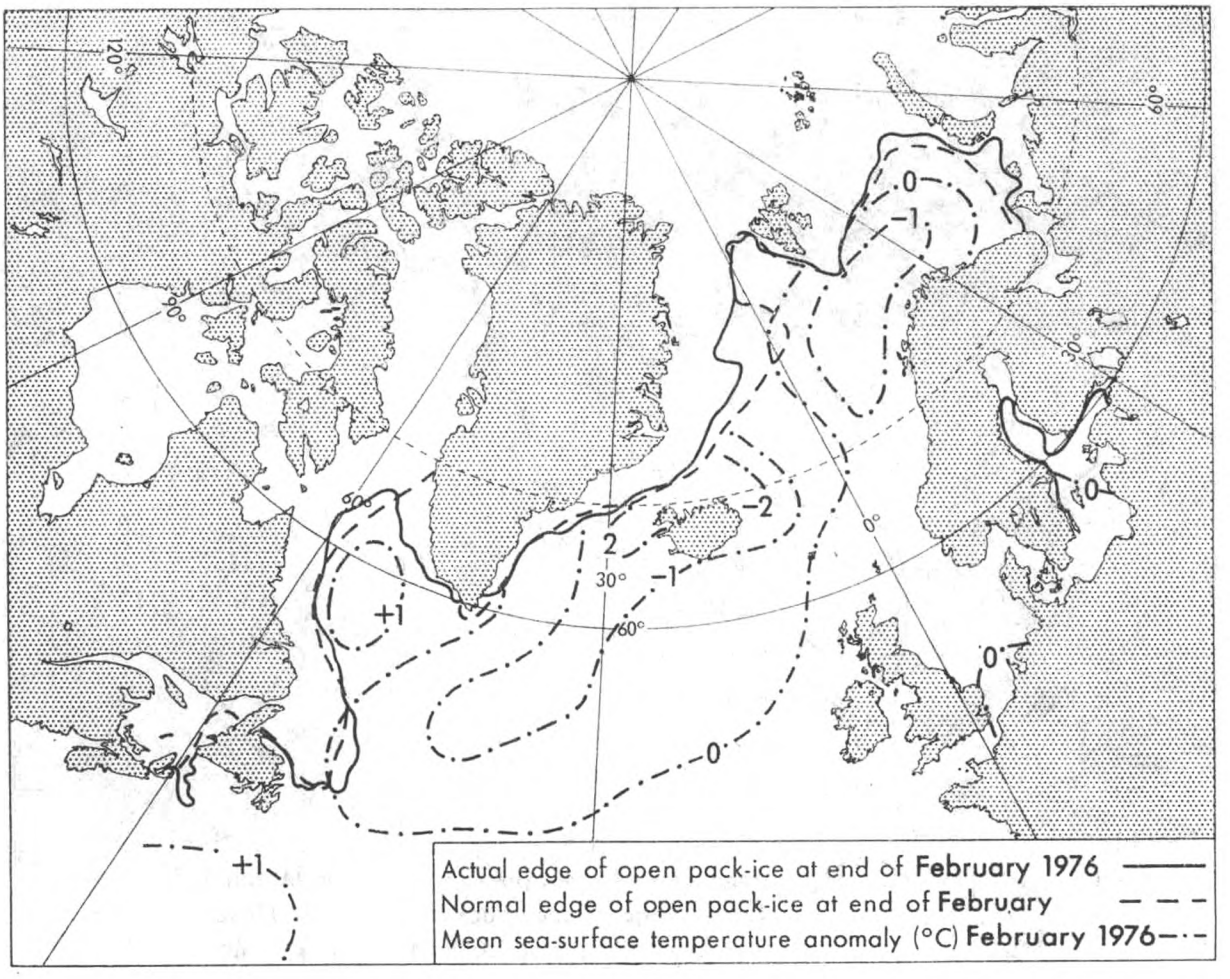
CODE

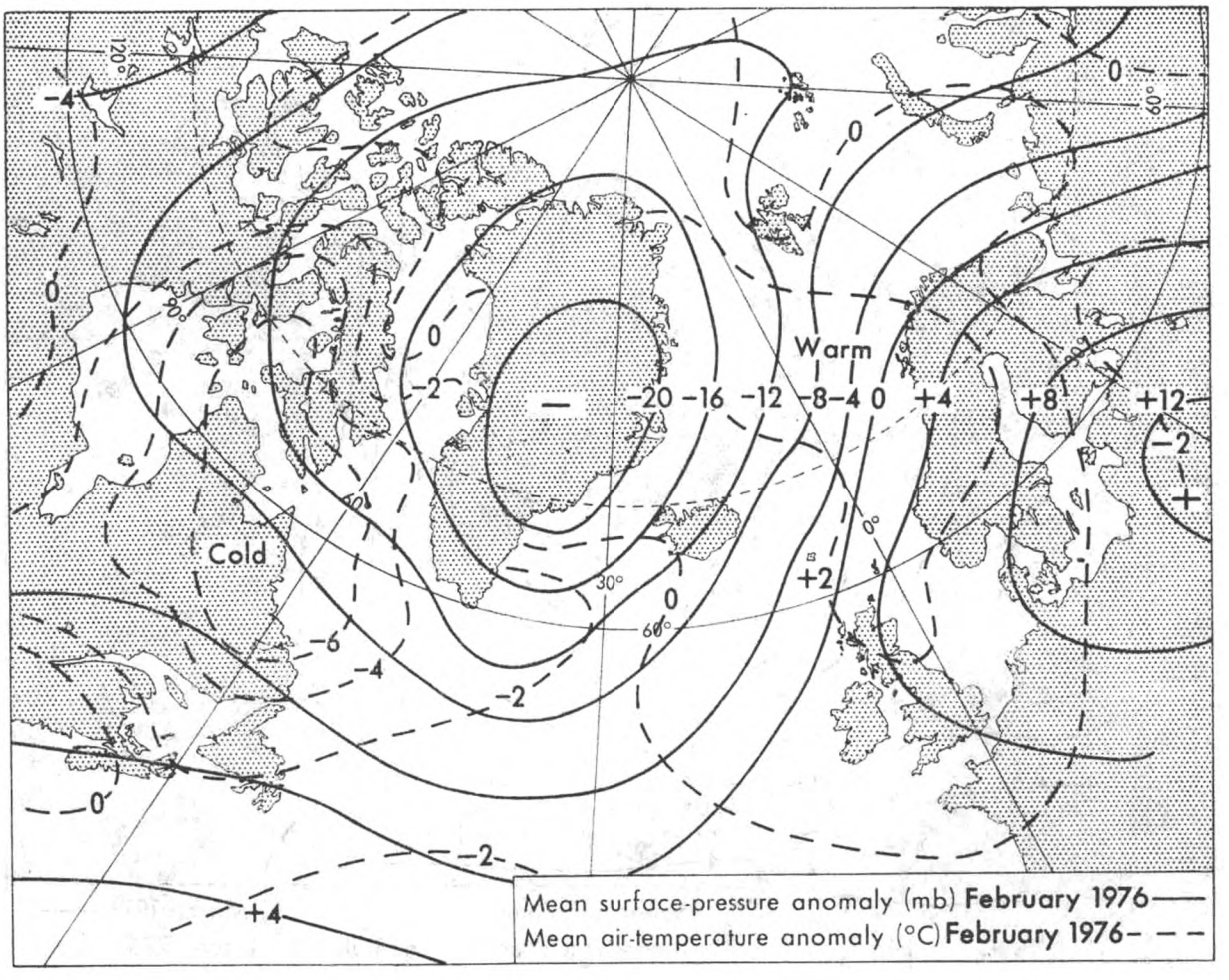
A First day ice reported.
B Last day ice reported.
C No. of days when ice was reported.
D No. of days continuous land-fast ice.
E No. of days of pack ice.
F No. of days dangerous to navigation, but assistance not required.
G No. of days assistance required.
H No. of days closed to navigation.
I Accumulated degree-days of air temperature (°C) where known.*

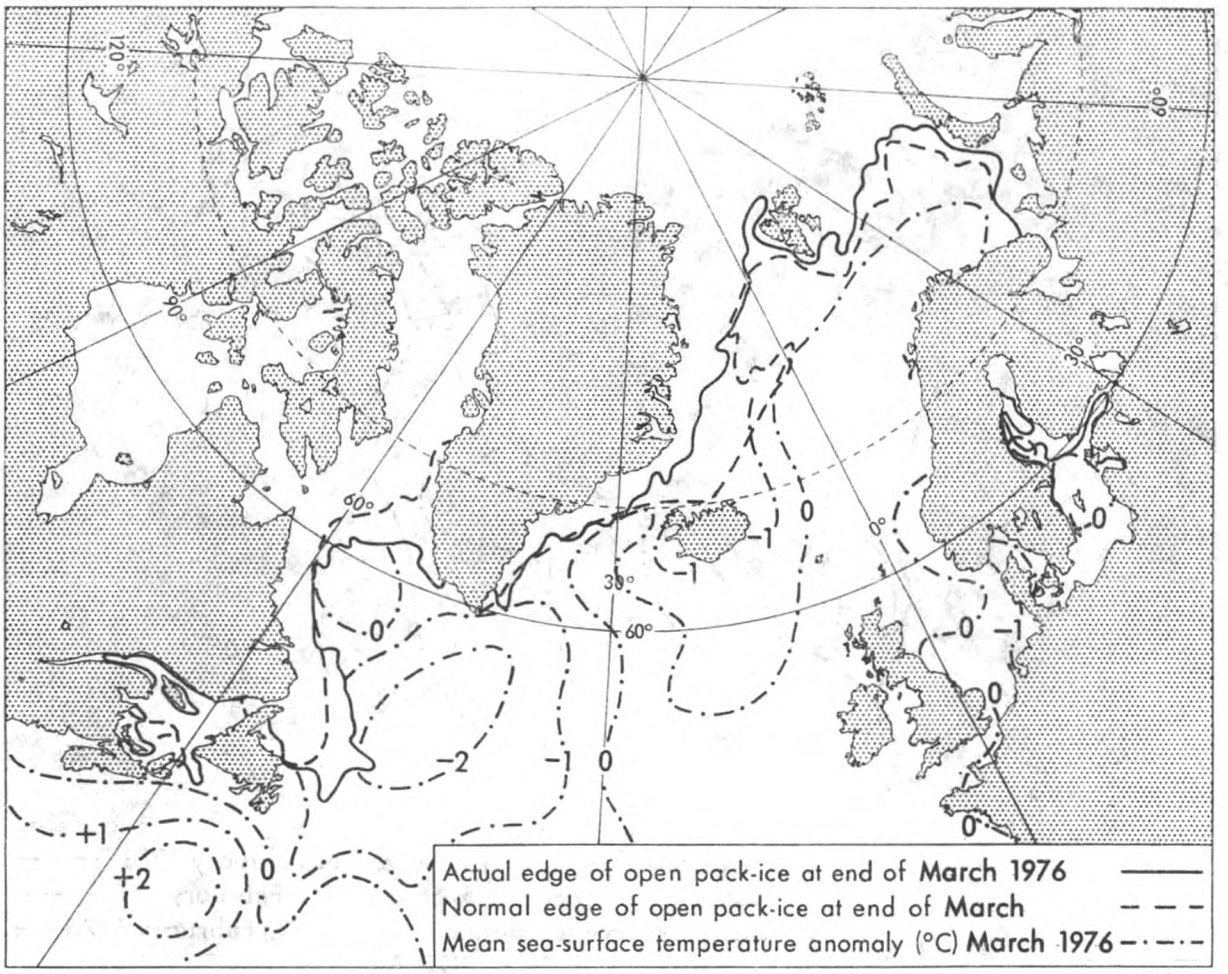
* These figures give a rough measure of the first probability of the formation of sea ice, and later the progress of the growth and its thickness. They are derived from daily averages of temperature (00 + 06 + 12 + 18 GMT) and are the sum of the number of the degrees Celsius below zero experienced each day during the period of sustained frost.

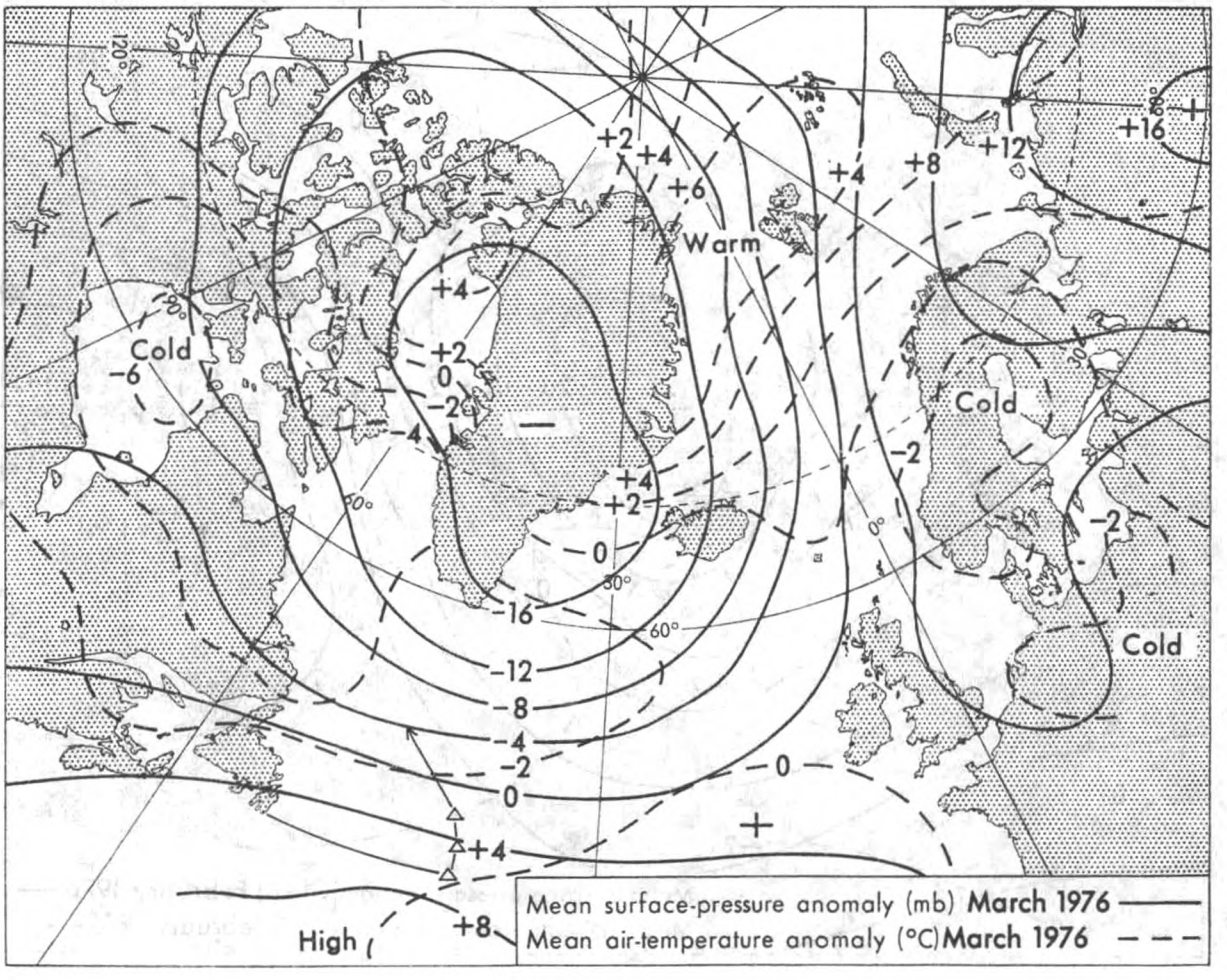

120°
60°
0°
30°
60°
0
-2
-1
0
+1
+2
+1
0
-1
-2
+2+1
+3
0
-2
-1
0
0
W
W
Actual edge of open pack-ice at end of January 1976
Normal edge of open pack-ice at end of January
Mean sea-surface temperature anomaly (°C) January 1976


120°
60°
0°
30°
60°
0
0
0
0
0
-2
-4
-6
-12
-8
-4
-2
0
0
+2
+4
+8
Cold
Cold
Warm
Mean surface-pressure anomaly (mb) January 1976
Mean air-temperature anomaly (°C) January 1976


Actual edge of open pack-ice at end of February 1976
Normal edge of open pack-ice at end of February
Mean sea-surface temperature anomaly (°C) February 1976


Warm
Cold
−20 −16 −12 −8 −4 0 +4 +8 +12
Mean surface-pressure anomaly (mb) February 1976
Mean air-temperature anomaly (°C) February 1976


Actual edge of open pack-ice at end of March 1976
Normal edge of open pack-ice at end of March
Mean sea-surface temperature anomaly (°C) March 1976


Warm
Cold
Cold
Cold
High
Mean surface-pressure anomaly (mb) March 1976
Mean air-temperature anomaly (°C) March 1976

Book Review

The Victorian and Edwardian Navy from old photographs. Commentaries by John Fabb. 260 mm × 195 mm. 172 photographs. B. T. Batsford Ltd, 4 Fitzhardinge St, London W1H 0AH, 1976. Price: £4·45.

Undoubtedly there are many ways of representing history, and the number of historical novels and even textbooks, which seem to contradict earlier works on the same subject, tend to show that later research and, it is to be feared, sometimes an author's opinion and method of presentation may often obscure a historical truth.

There can be no such doubt about the authenticity of the material in this book, for it is entirely pictorial with, of course, captions, and though some of the pictures belong to the very early days of photography, for instance three separate pictures of Trafalgar survivors taken in 1850, the camera cannot, nor ever could, lie. Indeed the advent of photography in the 1840s must have brought an entirely new dimension to history and given a personality to the most humble of seafarers.

Life at Sea, Work at Sea, Training, Campaigns, the Royal Marines, the Royal Navy, Leisure, Personalities and Uniform are the headings under which the photographs have been assembled and to your reviewer at least the whole book has been a voyage through nostalgic seas for they were the sort of pictures which fired his boyish imagination. Though the era is usually thought of as one of world peace, Britain was involved in many minor conflicts during the nineteenth century, and in these, the Royal Navy was the general handyman: bombardment from the sea, suppressing piracy and the Slave Trade, serving far inland during the Indian Mutiny and in the South African war, when ships' 12-pounder guns were actually landed and taken up country to assist in the relief of Ladysmith, bringing relief to the scene of natural disasters—those were the days when it was said, not without justification, that 'There is nothing the Navy cannot do'.

The passing of sail changed the face of sea life altogether, usually for the better; though it brought with it the torment of coaling ships. Your reviewer was 'in' at the end of that era when he served as midshipman RNR in the last coal-burning battleship *Emperor of India.* An introductory remark states 'It is still doubtful if the picture can convey the appalling dust which in six hours of coaling reached everywhere', for there were no tips, grabs or cranes; every piece of coal was manhandled from the lighter into the bunkers and it was a genuine 'all hands' job, only the medical staff 'standing fast'.

The era produced its 'characters' too; the Admiral who insisted on wearing a top hat instead of a uniform cap, a later Admiral who wore a 'button three' jacket instead of a 'button four'.

The reviewer is particularly intrigued by two pictures in the Royal Marines section, one bears the caption 'No soldier in uniform was allowed to encircle a young lady's waist with his arm. No such order circulated in the Royal Navy in 1899'. The second depicted 'A sailor assisting a Royal Marine at an assignation, 1899'. It should be remarked that even up to the 1930s all non-officer personnel in the Royal Navy and Royal Marines were required to wear uniform all their serving lives, on duty or on leave.

A scholarly introduction by A. P. McGowan, Head of the Department of Ships and a Deputy Keeper at the National Maritime Museum, gives additional life to this book and we should be grateful to Mr Fabb for assembling all the material while there is yet time, lest those days might be forgotten altogether.

L. B. P.

Personalities

OBITUARY.—We regret to record the death at sea of CAPTAIN W. S. COUNSELL on board the *Malwa* on 20 September 1975.

William Counsell, who was 51, joined Asiatic Steam Navigation Company in 1952 as 2nd Officer and transferred to Hain Nourse in June 1964 as Chief Officer. He was appointed Master in 1965 and, until his sad death, commanded bulk carriers and tankers of Hain Nourse's and P. & O. Bulk Cargo Division's Fleets.

Captain Counsell sent us his first meteorological logbook from the *Baron Scott* in 1951. Since then we have received a further 17 logbooks bearing his name of which 3 were classed as Excellent. He was selected for an Excellent Award in 1972.

We extend our sincere condolences to his widow and family.

RETIREMENT.—MR T. BERRY, Radio Officer, retired from the Marconi International Marine Company on 12 March 1976 after nearly 41 years at sea.

Theodore Berry joined Marconi as Radio Officer on 18 June 1935. He sailed on various foreign-going vessels until February 1956 when he joined the *Manchester Port* and then remained with Manchester Liners until June 1969. He completed his career at sea as Radio Officer on vessels of the Esso Petroleum Company.

Our records show that we received the first meteorological logbook bearing Mr Berry's name in 1948 from the *Teviot*. Since then he has been associated with a further 24 logbooks from various vessels of which 8 have been classed as Excellent. He gained an Excellent Award in 1963 for his work on board the *Manchester Regiment*.

We wish him health and happiness in his retirement.

RETIREMENT.—MR R. D. DINGLEY, Radio Officer, retired last January after serving nearly 50 years at sea.

Ronald Davenport Dingley joined Marconi International Marine Company as Radio Officer in September 1926 and remained with Marconi until his retirement. He was Radio Officer aboard the *Caprella* when she was sunk by enemy action in October 1940.

We received the first meteorological logbook bearing Mr Dingley's name from the *Clan Macnair* in 1949, and since then we have received a further 12 logbooks associated with his valuable voluntary work for us. He gained an Excellent Award in 1975.

We wish him health and happiness in his retirement.

RETIREMENT.—CAPTAIN I. E. G. DOWNER retired on 31 March 1976 after serving nearly 35 years with Shell Tankers.

Ivan Downer commenced his career at sea with Anglo-Saxon Petroleum Company (as Shell Tankers were then called) in July 1941. He was promoted 3rd Officer in 1944, 2nd Officer in 1946, Chief Officer in 1949 and was appointed Master in 1960.

During his career Captain Downer served on 40 ships of the Shell fleet, ranging in size from 311 tons to 312 000 tons deadweight, and commanded 19 of these. For a period he was seconded to Shell Exploration Company in the Persian Gulf during which he had command of tugs, survey craft and very small tankers. One of the latter, which Captain Downer believes commenced life trading between Goole and the Saltend oil terminal near Hull, proved to be no match for the Shamal wind of the Persian Gulf and on one passage between Doha and Bahrain almost foundered. She was only kept afloat by Captain Downer's action of going astern until sufficient water was bailed out by means of buckets!

Captain Downer sent us his first meteorological logbook from the *Northia* in 1952. Since than we have received a further 14 logbooks and SHRED forms bearing his name.

We wish him health and happiness in his retirement.

RETIREMENT.—CAPTAIN J. FERRES retired on 1 March 1976 after serving nearly 43 years at sea.

Captain Ferres first went to sea in July 1933 on deck with Anglo-American Oil Company with no intention of following a sea career. However, he took to sea life and commenced studying for a certificate with a view to a career within this Company.

On obtaining his 2nd Mate's Certificate he remained with Anglo-American Oil Company as 3rd Officer but on gaining his 1st Mate's Certificate in 1939 he transferred to Standard Oil Company of Hong Kong. Subsequently, whilst undergoing a gunnery course in Belfast, he was offered and accepted a position as 3rd Officer with Furness Withy and Company in 1940. He then served in several vessels of the latter Company, obtaining his Master's Certificate in 1942 and being promoted to Chief Officer later that year. Between 1943 and 1944 he commanded Great Lake vessels trading on the Atlantic seaboard. Loss of tonnage by enemy action resulted in his return to home service as Chief Officer. In 1946 he was appointed Staff Captain of the *Empire Rapier*, a troopship on the Hull–Cuxhaven service.

Captain Ferres was appointed master of the *Arabian Prince* in May 1955. There followed service in command of various vessels of the Furness Withy Group until his recent retirement from the Shaw Savill Line vessel *Drina*. During 1975 Captain Ferres was in command of the Shaw Savill ship *Mayfield* (see photograph opposite page 108), and the meteorological logbook compiled aboard at this time was assessed as one of the best received by the Meteorological Office for the year.

Captain Ferres sent us his first meteorological logbook from the troopship *Empire Halberd* in 1946. Since then we have received a further 17 logbooks bearing his name of which 11 have been classed as Excellent. He has been selected for an Excellent Award for 1975.

We wish him health and happiness in his retirement.

RETIREMENT.—MR J. GARDHOUSE, Radio Officer, retired in February from the sea staff of Marconi International Marine Company.

John Gardhouse joined Marconi in May 1929, resigned in April 1949 and rejoined in March 1969. During the war Mr Gardhouse was serving on the *Willowpool* when she was sunk by a mine in December 1939.

Our records show that we received the first meteorological logbook bearing Mr Gardhouse's name from the *City of Carlisle* in 1950 and since then he has been associated with a further 7 logbooks from various ships of the V.O.F. He received an Excellent Award in 1974.

We wish him a long, healthy and happy retirement.

RETIREMENT.—CAPTAIN J. D. GUYLER, Commodore Master of P. & O. General Cargo Division recently retired owing to ill-health.

Jack Davidson Guyler joined New Zealand Shipping Company from Ellerman Hall Line in 1940 as 4th Officer and was promoted Chief Officer in 1948. He was appointed Master in 1953.

Captain Guyler sent us his first meteorological logbook in 1946 from the *Ruahine*. Since then we have received a further 42 logbooks bearing his name of which no less than 30 were classed as Excellent. He received Excellent Awards in 1956, 1961, 1964, 1968, 1969, 1970, 1971, 1972, 1973, 1974 and 1975.

We wish Captain Guyler a speedy recovery in health and a long, happy retirement.

RETIREMENT.—Mr E. Heywood, Radio Officer, retired last February after 41½ years' service with Marconi International Marine Company.

Ernest Heywood joined Marconi as Radio Officer in July 1934. From 1954 to 1959 he served on the *Rathlin Head* and from 1959 to 1968 he was Radio Officer on the *Manchester Miller*.

Our records show that we received a meteorological logbook bearing Mr Heywood's name from the *Manchester Trader* in 1946. Since then we have received a further 20 logbooks with which he has been associated, 11 of which were classed as Excellent. Mr Heywood received Excellent Awards in 1948 and 1966.

We wish him good health and happiness in his retirement.

RETIREMENT.—Mr W. C. G. Sturgess, Radio Officer, retired on 31 December 1975 after 42 years with Marconi International Marine Company.

William Carey George Sturgess was born in 1912 and joined Marconi in December 1933 being appointed Radio Officer on board the *Carare*. In October 1939 when outward bound from Barry to South America on the *Stonepool* his ship was engaged in a successful gun duel with an enemy U-Boat for which Mr Sturgess received a small monetary award. In January 1953 he joined the *Dunera* and remained with her until 1965 when he transferred to the *Nevasa* and served on that ship until January 1975.

During his career at sea Mr Sturgess did much valuable voluntary work for the Meteorological Office and gained Excellent Awards in 1961, 1970 and 1971.

We wish him health and happiness in his retirement.

RETIREMENT.—Mr W. Williams, Radio Officer, retired from Marconi International Marine Company on 31 December 1975 after 46 years at sea. Wilfred Williams was born in 1908 and joined Marconi in July 1929. Between 1930 and 1940 he served in trawlers and during the war years was Radio Officer on board a Canadian Laker employed on the UK coast. More recently he served in Manchester Liner and P. & O. Cargo ships.

Our records show that we received the first meteorological logbook bearing Mr Williams's name from the *Suevic* in 1965. Since then we have received a further 16 logbooks of which 4 were classed as Excellent. Mr Williams received Excellent Awards in 1966, 1973 and 1975.

We wish him a long, healthy and happy retirement.

C. R. D.

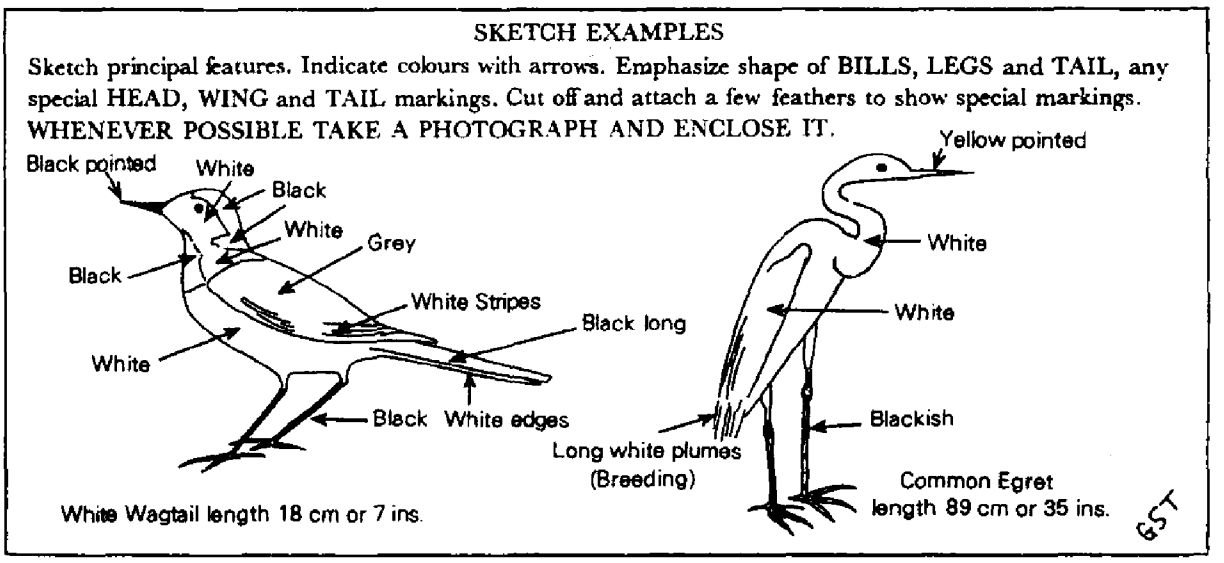
Editor's Note

Ornithological observations recorded in the additional remarks pages of ships' meteorological logbooks are forwarded to Captain G. S. Tuck, D.S.O., R.N., of the Royal Naval Birdwatching Society, who endeavours to identify every species reported for plotting on charts. The number of these observations has increased greatly in recent months and in order to lessen the work involved in identifying the birds, Captain Tuck has requested that whenever possible, the following information be included in each observation.

Description by means of a sketch showing, with arrows, the colours noted on the different parts of the bird—see examples below. The colour and type of bill, e.g. short, stubby, fine curved, stout hooked etc. should be quoted and a note made of whether the feet are webbed or lobed.

Measurements (preferably in millimetres but for large birds in inches or centimetres) as follows:

(a) greatest overall length from tip of bill to tip of tail with bird extended gently along a flat surface,
(b) greatest overall wing-span between tips of spread wings measured across the back,
(c) length of tail from base of central feathers to tip of longest tail feather, and
(d) bill length from margin of feathers above to tip of bill.



Membership of the Royal Naval Birdwatching Society is open to all Merchant Navy personnel and many officers of the Voluntary Observing Fleet are already members. Others who might be interested in joining the Society can obtain further information from

Captain G. S. Tuck, D.S.O., R.N.
Royal Naval Birdwatching Society
8 Little London
Chichester
Sussex PO19 1PH

Fleet Lists

GREAT BRITAIN (Information dated 19.3.76)

The following is a list of British ships which have been equipped with instruments and which voluntarily co-operate with the Marine Division of the Meteorological Office.

The names of the Masters, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return received is given in the second column; an asterisk indicates a new recruitment who has not yet sent in a logbook.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent of the Meteorological Office.

The Port Meteorological Officers will make personal calls on the Masters and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired.

Excellent Awards are made at the end of each calendar year. The names of the Masters, Principal Observing Officers and Senior Radio Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell.

Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Acavus	3.7.75	P. R. White	D. G. L. Curry, C. G. Woodnutt, R. Marshall	P. P. Cuffe	Shell Tankers (U.K.) Ltd.
Act 1	7.1.76	C. P. Leighton	A. L. Stout, B. Truran, J. D. Peake	D. O'Halloran	Associated Container Transportation Ltd.
Act 2	8.3.76	E. R. Jenkins	N. Eliason, G. Botterill, W. B. Olsen		Associated Container Transportation Ltd.
Act 6	16.1.76	J. dit-Leschery	M. W. Traynor, M. Read, C. Bryson		Associated Container Transportation Ltd.
Adventurer	11.12.75	C. D. Wilde	A. C. McMillan, N. Johnson, D. Garrett	D. Daly	T. & J. Harrison Ltd.
Afric Star	*	G. Ferriday	P. M. Moore, A. Whittard, H. N. Owen	A. K. Wilkins	Blue Star Line Ltd.
Agamemnon	19.2.76	A. J. Milmine	P. F. K. Usher, D. H. Atkin, J. David	A. W. Hay	Ocean Transport & Trading Ltd.
Albright Explorer	25.3.75	J. Wise	D. A. Maclean, R. T. Berry, W. M. Campbell	W. D. Brown	James Fisher & Sons Ltd.
Albright Pioneer	2.2.75	M. Rossiter	E. Crossin, P. A. Pepler, N. Fisher	W. P. M. Edmunds	James Fisher & Sons Ltd.
Alert	2.12.75	J. M. S. Lowe	W. Ellis	W. Holmes	Post Office
Alinda	27.6.72	P. I. Blackshaw	R. L. Cheshire, W. T. Selby, D. T. Kirkwood	C. G. Macaulay	Shell Tankers (U.K.) Ltd.
Amalric	6.5.75	F. G. Boize	D. F. McAulay, A. Ross, R. Keutenius	B. I. Bicknell	Shaw Savill & Albion Co. Ltd.
Amastra	5.6.75	G. C. Maconville	E. Southworth, G. Akehurst, M. Geddes	A. Macrae	Shell Tankers (U.K.) Ltd.
America Star	30.6.75	D. Gilmour	S. P. Crawley, T. Orford	W. Adams	Blue Star Line Ltd.
Ami	9.3.76	R. Dronon			Marine Exploration Ltd.
Amoria	2.9.75	B. Bowtell	M. B. Framptow, S. G. Williams, D. Toomer	C. Akyeam	Shell Tankers (U.K.) Ltd.
Anadara	24.2.76	G. T. Robertson	P. Derbyshire, R. Abbott, C. S. Case	B. J. Mullally	Shell Tankers (U.K.) Ltd.
Anchises	*	S. B. Gilliat	A. P. McCall, V. Rigo, H. Lawton	T. Smith	Ocean Transport & Trading Ltd.
Andalucia Star	*	P. W. W. Hunt	T. P. Green, J. Gray, R. H. Foden	C. M. Jackson	Blue Star Line Ltd.
Annuity	*	D. G. Munro	T. W. Cawson, D. A. Harris, I. L. Clemson		F. T. Everard & Sons Ltd.
Antilochus	15.3.76	G. Crangle	K. W. Smith, R. G. J. Wiltshire, J. A. Ratcliffe	B. L. Drake	Ocean Transport & Trading Ltd.
Armadale	18.2.76	F. J. Adams	A. P. Lowe, J. H. Crockett, J. Thornton	A. Dobson	Trinder Anderson & Co. Ltd.
Arrino	6.2.76	P. D. Guerrier	R. Lorne, D. McNamara, J. Beck	P. A. Barratt	Trinder Anderson & Co. Ltd.
Asiafreighter	19.1.76	N. A. Macdonald	W. Y. Chalmers, J. Mortimer, D. H. Thompson	J. Stephen	J. & J. Denholm Ltd.
Asialiner	13.2.76	B. French	P. C. Hewitt, D. M. Marshall, W. Rankine		J. & J. Denholm Ltd.

Asian Renown	17.12.75	N. W. Cockshoot	P. Doyle, B. Thompson, F. Garbutt	J. Lamb	Manchester Liners Ltd.
Asprella	21.8.75	M. Wilkie	I. C. Ingram, S. Hamill	P. Clementson	Shell Tankers (U.K.) Ltd.
Atlantic Causeway	6.2.76	A. Bull	I. R. Lewis, M. V. Coleman, C. Brammer	F. A. Dunn	Cunard-Brocklebank Ltd.
Atlantic Conveyor	4.3.76	B. L. O'Brien	I. R. Lewis, G. J. H. Peaston, P. W. Ings	D. Taylor	Cunard-Brocklebank Ltd.
Auckland Star	19.1.76	H. D. Windle	G. R. Henderson		Blue Star Line Ltd.
Author	15.3.76	I. Barbour			T. & J. Harrison Ltd.
Automedon	1.3.76	R. M. Simpson	R. Robinson, H. B. Woods, I. S. Grant	A. M. Begg	Ocean Transport & Trading Ltd.
Avelona Star	*	R. M. Burns	C. P. R. Clarke, T. C. Black, P. F. Lamb	J. R. Cunliffe	Blue Star Line Ltd.
Avonfield	17.6.75	W. A. Crawford	J. Rayne, H. Asquez, L. Green	T. James	Hunting & Son Ltd.
Avon Forest	8.3.76	A. Taylor			Harrisons (Clyde) Ltd.
Bamburgh Castle	26.6.75	B. G. Longley	S. M. Tankard, D. J. Robinson, P. Harris	K. Lancashire	W. A. Souter & Co. Ltd.
Baron Ardrossan	21.11.75	A. M. Fraser	C. J. Blane, D. J. D. Cursiter, E. T. Moodie	D. W. Humble	Scottish Ship Management Ltd.
Baron Inchcape	5.8.75	M. Turton	R. G. Wiggins, T. Halhead, G. Houston	D. Poole	Scottish Ship Management Ltd.
Baron Renfrew	8.10.75	B. W. Lawson	T. Dunlop, T. R. K. Walker, A. Weir	J. Forrester	Scottish Ship Management Ltd.
Beechbank	12.12.75	H. Barber	M. Trimble, I. Faithfull, R. Brown	A. Ray	Bank Line Ltd.
Bellerophon	16.7.75	W. J. S. Eynon	A. L. Crowe, R. K. Bowman, P. J. McConomy	S. J. B. Singleton	Ocean Transport & Trading Ltd.
Benalbanach	6.11.75	L. G. Powell	A. C. Whitehead, M. Simpson, A. Chapman	P. Hogan	Ben Line Steamers Ltd.
Benalder	9.2.76	A. McKenzie	A. S. Rankin, F. P. Gibb	P. Mannion	Ben Line Containers Ltd.
Benarty	12.1.76	A. D. Hay	G. J. Livingstone, J. M. Ferguson, J. W. Jarman	W. Ward	Ben Line Steamers Ltd.
Benattow	4.2.76	O. Henderson	T. V. Roberts, A. H. Glen, T. G. P. Trousdale	T. J. Slattery	Ben Line Steamers Ltd.
Benavon	9.3.76	J. R. Morrison	D. Keillor, J. Fleming	J. Crockett	Ben Line Containers Ltd.
Bencruachan	1.12.75	O. Tucker	C. S. Mackay, I. Steele, C. Macleod	J. Daly	Ben Line Steamers Ltd.
Bendearg	3.11.75	R. Griffiths			Ben Line Steamers Ltd.
Bendoran	23.2.76	R. McPhee	A. O. Dundas, I. M. Lindsay, J. K. Law	J. Kelly	Ben Line Steamers Ltd.
Benefactor	15.12.75	W. G. Jackson	A. Atkin, R. J. Yelland, M. S. Brooks	P. G. Lyons	T. & J. Harrison Ltd.
Bengloe	5.2.76	H. H. McIntosh	I. Aitchison, T. D. Corbett, C. D. W. Gregory, A. Main	G. F. Cummings	Ben Line Steamers Ltd.
Benlawers	14.10.75	J. R. Rodger	W. Sinclair, R. Coles, I. MacIver	H. Brookfield	Ben Line Steamers Ltd.
Benledi	17.10.75	A. Burnett	G. A. Boobyer, A. J. B. Gunner, R. D. M. Budge	W. Parkinson	Ben Line Steamers Ltd.
Benlomond	17.10.75	A. Yuill	C. J. A. Cladingbowl, G. Stevens	W. C. Cumming	Ben Line Steamers Ltd.
Benloyal	25.11.75	W. C. Watson	W. A. Horsburgh, I. A. Marshall, G. D. Fergus	R. Sadler	Ben Line Steamers Ltd.
Benreoch	17.11.75	I. R. Ansell	A. W. Campbell, J. E. Robertson, R. R. O. Towner	F. McLaughlin	Ben Line Steamers Ltd.
Benstac	31.12.75	T. P. Barr	R. S. Basford, J. R. E. Paterson, J. I. Brown	W. M. Fryer	Ben Line Steamers Ltd.
Benwyvis	15.12.75	J. G. Adamson	A. M. Myall, J. Atkinson, G. McDonald	C. M. Crook	Ben Line Steamers Ltd.
Bhamo	7.1.76	S. F. Garside			Ocean Transport & Trading Ltd.
Birchbank	28.8.75	A. E. Newton	G. J. Waldron, S. J. Hulme, B. F. Fountain	J. S. C. Kucharski	Bank Line Ltd.
Blenheim	16.1.76	D. Buckley	P. Barber, R. Middleton, M. Jordan	V. G. Merriott	Fred Olsen Ltd.
Booker Vanguard	12.1.76	R. McKechnie	J. J. Breen, M. T. Corner, R. N. Bell	A. Moss	Booker Line Ltd.
Booker Venture	17.3.76	R. E. Dunne			Booker Line Ltd.
Booker Viking	5.6.75	E. J. Jones	D. Heaton, W. A. Hill, F. J. Chandler	D. A. C. MacRae	Booker Line Ltd.
Border Castle	12.9.72	C. L. Southcombe	C. H. James, P. J. Donnelly, H. M. Bates	G. Minay	Common Bros. Ltd.
Botany Bay	8.3.76	J. D. Thomson	R. B. Gurney, C. R. Short, A. N. Pike	R. P. Bate	Container Fleets Ltd.
Bransfield	2.6.75	S. Lawrence	H. F. Monckton, B. D. Cramond, N. A. Beer, G. Carter	H. M. O'Gorman	British Antarctic Survey
Brasilia Star	29.12.75	H. W. McNeil	R. Hosking, A. D. Smith, C. R. Mundy	J. Pritchard-Gordon	Blue Star Line Ltd.
Briarthorn	29.10.75	R. Alderdice	J. F. McGlinchary, J. Waters		S. William Coe & Co. Ltd.
Bristol Clipper	9.10.75	O. H. Cook	U. Kapoor, A. M. Oxberry	P. F. J. Kelly	I. F. R. Services Ltd.
British Avon	20.11.75	D. McCallum	A. Heather, D. Brown, B. Wardman	J. Sutherland	B.P. Tanker Co. Ltd.
British Beech	15.12.75	L. A. Woodward	P. T. Wild, N. R. Huggins, D. J. Ridgway	I. Hughan	B.P. Tanker Co. Ltd.
British Commodore	10.3.76	J. Pinkney	D. Handley, R. Hood, M. Dunning	P. J. Whiteley	B.P. Tanker Co. Ltd.
British Cormorant	24.2.76	W. Callaghan	R. R. Ardill, T. Wilson, D. J. Williamson	D. Sleeman	B.P. Tanker Co. Ltd.
British Cygnet	12.1.76	R. Denholm	J. Harper, D. R. Cummins	J. Hasling	B.P. Tanker Co. Ltd.
British Esk	9.3.76	D. Coombes	R. W. Fleming, M. J. Evans, P. F. Robinson	D.I. Busveids	B.P. Tanker Co. Ltd.
British Forth	3.3.76	D. H. Henderson	G. R. J. Joshua, M. C. Nicholson	M. J. Jennings	B.P. Tanker Co. Ltd.
British Hazel	10.2.76	T. M. Y. Richards	G. English, D. A. Coleman, S. G. Millar	A. Gurney	B.P. Tanker Co. Ltd.
British Holly	14.1.76	H. Phillips	C. J. Davison, D. Glendinning	R. J. Bryne	B.P. Tanker Co. Ltd.
British Ivy	9.12.75	R. Longhorn	P. F. St. Lawrence, N. Jenkinson, D. O'Hagan	P. Early	B.P. Tanker Co. Ltd.
British Kennet	14.1.76	M. V. McCarthy	P. W. Wilson, G. Vandenbergh, J. Dunford	D. W. Bone	B.P. Tanker Co. Ltd.

Selected Ships (*contd.*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
British Liberty	7.10.75	R. F. Shaw	J. F. Coyne, B. Marshall, A. Warren	J. Yates	B.P. Tanker Co. Ltd.
British Maple	31.12.75	F. W. Lamb	P. John, J. W. Knight, C. Taylor	S. C. Barnes	B.P. Tanker Co. Ltd.
British Spey	29.4.75	J. W. Graves	L. M. Coupland, C. Parry, R. Warran	P. Rogers	B.P. Tanker Co. Ltd.
British Swift	24.10.75	D. S. Dalton	M. Mason, N. Carrington, M. A. Gough	M. J. Walsh	B.P. Tanker Co. Ltd.
British Tamar	23.2.76	D. N. Peck	F. B. Whamond, K. W. Bainbridge, J. H. Wright	S. R. Tuck	B.P. Tanker Co. Ltd.
British Tay	*	D. G. Downie	D. Sawyer, G. J. Pearson, I. Fee, K. Peacock	R. Quirk	B.P. Tanker Co. Ltd.
British Trent	*	R. Weston	M. R. Nelms, S. Morrison, D. Kinnaird	D. I. Busveids	B.P. Tanker Co. Ltd.
British Vine	4.3.76	D. Keiller	H. Griffin, A. F. Lawrenson, B. Gorman	J. Macdonald	B.P. Tanker Co. Ltd.
Buenos Aires Star	4.2.76	R. A. Young	G. D. H. Wilson, N. A. Ianson	D. R. McWhirter	Blue Star Line Ltd.
C.P. Discoverer	22.1.76	E. Metham	V. Edwards, M. T. P. McMahon, R. C. W. Cumbes	R. G. Cope	Canadian Pacific Steamships Ltd.
C.P. Trader	31.12.75	J. Waling	J. L. White, P. C. H. Adair	T. J. Graves	Canadian Pacific Steamships Ltd.
C.P. Voyageur	2.12.75	R. K. Drakel	A. Griffiths, G. B. Ivens, R. Reed	C. R. Clarke	Canadian Pacific Steamships Ltd.
Cairnsmore	*	C. A. Morrison	A. Jeffery, C. A. Lines, R. Winn	M. Lambert	Jardine Matheson & Co. Ltd.
California Star	14.1.76	I. C. Mackintosh	G. S. Hart, D. Wadley, I. Mackillop	W. Maclean	Blue Star Line Ltd.
Cantaloup	9.12.74	C. J. Knight			Druidstan Ltd.
Canterbury Star	22.7.75	E. Blake	E. Jones, D. Barnicoat, N. J. Hamer	R. Crockett	Blue Star Line Ltd.
Cape Horn	9.1.75	B. W. Lawson	G. S. Adams, D. I. Jones, A. Logan	R. Burton	Lyle Shipping Co. Ltd.
Cape Howe	2.2.76	W. Warden	M. J. Barrington, L. G. Morison, B. R. Sharp	F. T. Howard	Lyle Shipping Co. Ltd.
Cape Leeuwin	19.1.76	G. W. Roger	D. Johnston, D. D. Taylor	L. J. Anderson	Lyle Shipping Co. Ltd.
Cape Nelson	1.3.76	P. Richardson	M. J. Barrington, S. Yeamans, J. Hood	B. G. Breslin	Lyle Shipping Co. Ltd.
Cape Ortegal	*	K. N. Dootson	W. Andersen, C. R. Williamson, J. Paten	N. Smith	Lyle Shipping Co. Ltd.
Cape Sable	19.1.76	T. R. Baker	R. Dodd, A. Maxwell, J. W. Purdon, W. Mitchell	M. Thomas	Lyle Shipping Co. Ltd.
Cape Wrath	18.2.76	A. C. Hunter	J. F. Dobson, D. A. Clarke, P. Brennan	T. S. Davies	Lyle Shipping Co. Ltd.
Cape York	20.1.76	P. B. Hall	D. N. Fenton, R. C. Bucknall, E. R. Williams	D. Poole	Lyle Shipping Co. Ltd.
Carchester	6.2.75	J. B. Kerr	J. A. Pretswell, W. Blacklaw, D. Bradbury	D. L. Morrison	Christian Salvesen (Shipping) Ltd.
Cardigan Bay	3.3.76	D. Belk	P. Wright, I. Cox	C. Bent	Ocean Transport & Trading Ltd.
Cargo Vigour	31.12.75	J. Baker	W. H. Murphie, S. Carlisle, A. Talbot	J. J. McRory	Manchester Liners Ltd.
Cargo Zeal	5.2.76	B. A. Nelson	M. C. Piercy, R. A. Gill, R. Waterton	P. Byrne	Manchester Liners Ltd.
Carrel	11.9.75	D. F. Durbin	A. Jeffery, P. A. Dunlop, Pang Kim-Wing	R. L. Swinstead	Jardine Matheson & Co. Ltd.
Cast Beaver	18.2.76	W. F. Joyce	K. C. Robertson, M. A. Chapple, T. Gordon	K. F. Lancashire	G. Heyn & Sons Ltd.
Cedric	29.12.75	I. S. M. Condie	D. E. McAulay, D. Stewart-Taylor, I. Hepple	T. E. Bint	Shaw Savill & Albion Co. Ltd.
Challenger	15.12.75	P. H. P. Maw	J. D. Noden, P. J. Macdermott	A. S. J. Broadbent	Natural Environment Research Council
Cheviot	31.1.75	H. Dishman	I. G. Robertson, R. McAdam, G. A. Jones	H. H. Lyon	W. A. Souter & Co. Ltd.
Chrysantema	23.4.75	B. Chippendale	P. R. Rugg, P. H. Dathan, T. H. Schoefield	S. P. M. McEntee	Whitco Marine Services Ltd.
Cirolana	26.1.76	T. H. Finn			Ministry of Agriculture, Fisheries & Food
City of Auckland	5.12.75	F. Smith	N. J. R. Kerr, M. K. Ashok		Ellerman Lines Ltd.
City of Canberra	25.11.75	E. G. George	I. Robertson, M. Fagan, P. Askew	J. Fields	Ellerman Lines Ltd.
City of Capetown	3.11.75	G. H. Salter	M. S. Shakespeare, D. MacPherson, R. Hornshaw	A. W. T. Camp	Ellerman Lines Ltd.
City of Colombo	30.10.75	I. Lumley	C. J. Lee, S. Poole, V. K. Sarawgi	P. A. Dews	Ellerman Lines Ltd.
City of Dundee	14.10.75	D. W. Anderson	P. Rogers, I. C. Giddings, P. Jackson	M. Lavan	Ellerman Lines Ltd.
City of Edinburgh	22.1.76	S. Murray	W. Muir-Kay, J. N. Macnish, D. A. Grant	F. Patterson	Ben Line Containers Ltd.
City of Exeter	27.3.75	T. E. Kelso	A. M. Bradley, D. J. Perry, C. V. Umrigar	S. J. Griffith	Ellerman Lines Ltd.
City of Glasgow	21.1.76	J. G. Hill	M. J. Owen, A. Suddaby, D. B. Malhotra	J. Dunnion	Ellerman Lines Ltd.
City of Gloucester	*	P. Redhead, R.D.	W. J. Crowner, P. C. Webber, R. D. Harvey	E. Smith	Ellerman Lines Ltd.
City of Guildford	17.11.75	D. Brown	G. Shore, E. Webster, K. H. Kharas	D. Reddy	Ellerman Lines Ltd.

City of Hull	*	B. Torrance	R. Jayaratne, G. Railson, D. Miller		Ellerman Lines Ltd.
City of Lancaster	4.3.76	P. E. Harwood	C. G. Beresford, C. C. Broadbridge, P. J. Butterfield	D. A. Gowans	Ellerman Lines Ltd.
City of Limassol	15.3.76	R. O. Jones	P. J. Gadd, P. C. Williams		Ellerman Lines Ltd.
City of Liverpool	30.9.75	J. I. Owen	D. MacPherson	W. Beverley	Ellerman Lines Ltd.
City of London	27.8.75	W. S. Coutts	J. P. T. Smith, J. H. Nayes	J. Butler	Ellerman Lines Ltd.
City of Montreal	20.1.76	A. A. Ramsden	C. J. Harding, I. C. Dorse, B. Foster	N. Lovell	Ellerman Lines Ltd.
City of Newcastle	14.10.75	H. P. Wharton	B. R. Karenga, E. Oliver, M. Carruther	D. O'Reilly	Ellerman Lines Ltd.
City of Ottawa	2.3.76	T. Mallory	R. G. Edwards, P. A. Marcon, N. Frampton	P. L. Sheehy	Ellerman Lines Ltd.
City of Ripon	27.10.75	M. W. Hartley	J. E. Quain, J. Crawford, B. G. Phipps	A. Dempsey	Ellerman Lines Ltd.
City of St. Albans	30.12.75	J. Sapp	P. Hancock, S. C. Kanwar, M. L. Russell	W. G. O'Connell	Ellerman Lines Ltd.
City of Toronto	31.12.75	P. H. Sooner	A. Cosgrove, A. Booth, D. G. Spooner		Ellerman Lines Ltd.
City of Wellington	20.1.76	J. A. Macleod	T. Gwynne, B. F. Keith, J. Sherwin	A. E. Leeder	Ellerman Lines Ltd.
City of Worcester	2.2.76	D. Cullen	A. Booth, A. R. Lucas, R. M. Cosgrove	J. Neenam	Ellerman Lines Ltd.
Clan Alpine	31.12.75	M. Whiteley	D. J. Harris, R. Ward, T. G. Whittaker	D. Withers	Clan Line Steamers Ltd.
Clan Graham	*	S. Hagan	S. Thomas, A. Rapkin, R. Speight	H. Mitchell	Clan Line Steamers Ltd.
Clan Grant	17.3.76	R. D. Lofts	A. J. Gladman, M. A. McMillan, R. P. Gribble	D. M. Gibbs	Clan Line Steamers Ltd.
Clan Macgillivray	12.8.75	H. J. Thorn	S. D. Cobley, P. Macarthur, R. W. Hanratty	J. K. Paterson	Clan Line Steamers Ltd.
Clan Macgregor	5.11.75	P. N. V. Rewell	I. M. Ward, M. Jackson, A. M. H. Mohamed	W. Latus	Clan Line Steamers Ltd.
Clan Macilwraith	16.3.76	A. A. Graham			Clan Line Steamers Ltd.
Clan Macindoe	10.3.76	T. E. Roberts	R. R. Black, A. G. Mell, C. Bagwell	E. I. Kelly	Clan Line Steamers Ltd.
Clan Macinnes	3.2.76	R. E. Todd	S. J. Ivey, M. J. Hanschell	J. T. O'Neill	Clan Line Steamers Ltd.
Clan Macintosh	11.2.76	L. H. Bainton	R. A. Hamilton, R. Smith, H. D. Kessler	R. S. Wheeler	Clan Line Steamers Ltd.
Clan Maciver	17.2.76	R. F. Fullarton	D. F. W. Bradley, J. Simpson, S. Jackson	T. C. Willis	Clan Line Steamers Ltd.
Clan Maclaren	21.8.75	L. H. Bainton	R. A. Bacon, G. D. Mobbs, J. E. Dingle	D. M. Gibbs	Clan Line Steamers Ltd.
Clan Maclean	27.8.75	W. Davidson	A. G. Papworth, C. R. Finch, C. Jones	R. Wheeler	Clan Line Steamers Ltd.
Clan Macleod	11.3.76	S. M. Grant	K. P. Davie, A. Oxley, M. R. Cochrane	E. G. Lewis	Clan Line Steamers Ltd.
Clan Macnab	5.11.75	T. L. Kirby	A. R. McCulloch, E. Martin, N. D. Crockett	N. McKinven	Clan Line Steamers Ltd.
Clan MacNair	31.12.75	W. J. Howson	A. J. A. Aston, T. R. Alder, R. K. Metcalfe	B. C. Whiteford	Clan Line Steamers Ltd.
Clan Malcolm	13.2.76	A. D. Terras	D. N. R. Roberts, B. J. Ross-Smith, P. J. Fawcett	A. W. J. Macleod	Clan Line Steamers Ltd.
Clan Matheson	25.11.75	R. M. Bessant	C. Cooke, D. L. Sinclair, N. J. Hughes	E. C. Stout	Clan Line Steamers Ltd.
Clan Menzies	21.10.75	A. R. Macintyre	P. G. Powell, R. W. Gebbie, P. M. Simpson	D. J. Oakden	Clan Line Steamers Ltd.
Clan Ramsay	25.11.75	S. Hay	J. E. Millar, R. A. Milne, M. W. H. Williams	D. R. McLean	Clan Line Steamers Ltd.
Clan Ranald	22.9.75	G. B. Thomson	S. P. Pink, I. R. Brimelow, C. H. Wood	E. G. Lewis	Clan Line Steamers Ltd.
Clan Robertson	11.9.75	J. B. Caley	J. F. Pink, R. S. Grant, J. R. Gilburt	D. J. M. Young	Clan Line Steamers Ltd.
Clan Ross	28.8.75	F. G. King	J. R. D. Hart, J. M. Wilcock, M. J. M. Bedford	J. N. Duckworth	Clan Line Steamers Ltd.
Clement	*				Blue Star Line Ltd.
Clione	31.12.75	J. R. French			Ministry of Agriculture, Fisheries & Food
Collin	22.5.75	P. J. Sullivan	P. Bruce, K. V. T. Kutty, J. P. Chan	C. S. Shelton	Jardine Matheson & Co. Ltd.
Columbia Star	10.11.75	A. Chivers	R. Hill, R. B. Tilley, J. H. Turner	D. Briggs	Blue Star Line Ltd.
Conon Forest	15.7.75	N. Campbell	A. H. Maclenan, B. G. Frieze, B. Orange	S. J. Kirkwood	J. & J. Denholm Ltd.
Corella	30.11.75	J. E. M. Balfour	C. Snowling, E. Bridge, H. Saunders		Ministry of Agriculture, Fisheries & Food
Cornish Wasa	*	R. A. Reay	J. R. Scott, J. Bashford, R. T. Sneeden	G. H. Williams	Whitco Marine Services Ltd.
Cumberland	11.6.75	H. R. Phillips	D. E. Rook, R. A. Carver, N. J. Horobin	R. Shone	P. & O. S.N. Co.
Cumbria	19.1.76	P. J. E. Charman	J. Keppie, P. H. Aldous, R. Gibbons	H. Derbyshire	Hadley Shipping Co. Ltd.
Cunard Carrier	5.2.76	J. B. Clemenson	M. C. Julier, M. S. Polson, R. C. Ross	T. Robinson	Cunard S.S. Co. Ltd.
Cuthbert	*	N. F. Sharp			Booth S.S. Co. Ltd.
Dalesman	26.1.76	S. Marlowe	A. Sambavamoorthy, D. Cowens, A. Joyce	D. J. O'Brien	T. & J. Harrison Ltd.
Dart America	31.12.75	D. Hine	C. A. Laurence, P. A. Brown, P. N. Tester	I. Conn	Bibby Line Ltd.
Dart Atlantic	22.3.76	D. Hine	R. G. Starr, R. P. Ogden, R. Wyatt	A. E. Fell	Bibby Line Ltd.
Degema	30.1.76	N. Richardson	J. C. Mahoney, D. W. Bunyan, D. G. Roughley	R. Girvan	Ocean Transport & Trading Ltd.
Deido	10.5.73	E. Woosey	S. H. Barnet, C. D. Warren	R. J. P. Williams	Ocean Transport & Trading Ltd.
Derbyshire	23.4.75	K. D. Miller	P. T. Joy, K. G. Blacker, R. Milton	B. J. Foley	Bibby Line Ltd.
Discoverer	5.2.76	W. E. Hinde	N. J. Bevan, L. W. Burton, O. M. Owen	G. A. Ferrand	T. & J. Harrison Ltd.

Selected Ships (*contd.*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Discovery	9.12.75	E. M. Bowen	P. A. Booker		Natural Environment Research Council
Discovery Bay	2.3.76	L. E. Howell	C. M. Croome, N. H. Lampe, P. S. E. Cave	P. T. Look	Container Fleets Ltd.
Donga	16.5.73	W. E. Bowden	G. A. Bateman, S. T. Houldsworth	T. J. Smith	Ocean Transport & Trading Ltd.
Donnington	*				Stephenson Clark Ltd.
Drina	31.12.75	J. Fox	G. Morgan, T. W. Mitchell, J. Huddleston	P. Regan	Shaw Savill & Albion Co. Ltd.
Dumbaia	16.12.75	B. A. Hood	P. S. Bhatia, R. Maclure, P. L. P. Vanbergen	B. Jones	Ocean Transport & Trading Ltd.
Dunkwa	8.1.76	B. W. Fowler	D. M. Dixon, J. D. G. Williams, M. A. Hayes	C. Branthwaite	Ocean Transport & Trading Ltd.
Dunstanburgh Castle	27.1.76	R. W. Webb	J. P. Shaw, T. I. Drever, J. Awdeicj	M. D. Dixon	W. A. Souter & Co. Ltd.
Ebani	15.10.75	A. Richards	R. C. Allan, J. Cushman, G. Illingworth	N. Foulkes	Ocean Transport & Trading Ltd.
Edinburgh Castle	16.1.76	P. G. Eckford	D. M. G. Hazell, K. Eunson, G. Koch	W. Eckersley	Union-Castle Mail S.S. Co. Ltd.
Edinburgh Clipper	10.11.75	P. Sherriff	K. C. Robinson, L. Simpson, J. K. Wilkinson	G. Cliffe	Whitco Marine Services Ltd.
Edward Forbes	3.11.75	B. A. Chapman	K. O. Avery, R. I. P. Coutts		Natural Environment Research Council
Egton	31.12.75	W. T. Maltman	N. G. Harry, J. Callan, P. A. Montgomery	C. Kirtley	Roland & Marwood S.S. Co. Ltd.
El Lobo	10.2.76	P. B. Robier	A. S. MacMillan, D. Castle, R. S. Smellie	M. Breathnach	Bowring S.S. Co. Ltd.
Elmbank	30.9.75	G. D. Scott	P. M. Goding, F. D. Harron, D. Thomas	D. C. Stephen	Bank Line Ltd.
Elmina Palm	24.2.76	D. Fleming-Millar	P. Thomas, P. Black, J. Wright		Palm Line Ltd.
Encounter Bay	9.2.76	J. Blackburn	D. R. Peel, A. J. Fee, C. D. Smith	R. Redhead	Container Fleets Ltd.
Erawan	24.2.76	J. N. Edwards	A. Whittle, M. A. Colettis, J. A. Hamilton	Tsang Che Chin	John Swire & Sons Ltd.
Ernebank	20.10.75	C. C. Creasey	G. A. B. Ward, S. I. McGeown	F. McGuckin	Bank Line Ltd.
Esso Caledonia	23.2.76	W. D. B. Boler	J. W. Aalen, K. H. Milne, C. G. Starr	D. Leeson	Esso Petroleum Co. Ltd.
Esso Cambria	5.11.75	F. Verbist	G. Foxcroft, D. R. Garbutt, R. Gunns		Esso Petroleum Co. Ltd.
Esso Mercia	12.12.74	F. W. Stubbs			Esso Petroleum Co. Ltd.
Esso Ulidia	1.3.76	A. J. Washbourne	W. Hardy, G. Knowles, A. D. Stuart	R. A. Milliken	Esso Petroleum Co. Ltd.
Esso Warwickshire	17.10.75	R. W. Noakes	P. M. Thorp-Hincks, F. Clayton, K. Hebdon	E. Gregan	Esso Petroleum Co. Ltd.
Ethel Everard	15.7.74	H. O. Roberts	S. McGillivray		F. T. Everard & Sons Ltd.
Eucadia	28.11.74	T. R. Rowe		D. B. O'Donoghue	Walter Runciman & Co. Ltd.
Eurofreighter	10.3.76	N. A. Macdonald	F. C. Maciver, W. Rankine, P. C. Hewitt	J. Blane	J. & J. Denholm Ltd.
Euroliner	30.9.75	W. R. Williamson	G. B. McConachie, M. Burns		J. & J. Denholm Ltd.
Explorer	30.9.75	C. D. Riley	A. Coala, P. Holloway	K. Alexander	T. & J. Harrison Ltd.
Explorer (F.R.S.)	4.9.75	D. L. Rattray	J. Ross		Dept. of Agriculture & Fisheries for Scotland
Fernie	10.3.76	E. D. Stewart	G. J. Davies, S. Chand, M. Hammond	M. G. Welsh	P. & O. S.N. Co.
Finnamore Meadow	12.12.74	C. Newson	P. G. I. Rodgers-Gray, J. Morrison, P. I. Roberts	S. H. Dobson	Mavroleon Bros. Ltd.
Flinders Bay	28.1.76	J. H. Hutson	P. R. Simpson, P. Wood, M. J. Howorth	C. K. Thornally	Container Fleets Ltd.
Foreland	24.2.75	J. L. Downie	F. Birnie, C. S. Bishop-Laggett		Shipping and Coal Co. Ltd.
Fourah Bay	10.12.75	R. McL. Munro	H. S. Soni, P. J. Burden	H. N. Kinley	Ocean Transport & Trading Ltd.
Fremantle Star	20.12.74	W. G. Jones	N. B. Meek, K. I. Holden, R. Guy, J. S. Franklin	T. Milligan	Blue Star Line Ltd.
Fresno City	5.9.75	R. I. Crawford	A. A. Field, R. E. Baker, B. M. Richardson	R. J. Preece	Sir Wm. Reardon Smith & Sons Ltd.
Frontier	16.1.75	J. Williamson	B. G. O'Toole, A. G. Lacey, D. J. Bancroft	P. A. Byrne	Manchester Liners Ltd.
Furness Bridge	22.8.74	J. S. Leask	R. A. Hawkins, D. Gow, M. Holland-Lloyd		Houlder Bros. & Co. Ltd.
Gambada	17.9.75	A. O. Copeland	N. Vause, P. R. Dew, P. Burletson, R. G. Jenkin	R. J. Leeds	P. & O. S.N. Co.
Gazana	16.1.76	P. R. Malarky	J. Donne, S. Yeamans, K. B. Lowery	P. R. Thomas	P. & O. S.N. Co.
Geestcrest	24.2.76	O. Springett	G. Taylor, M. Talbot, G. MacDonald	G. T. Bruce	Geest Industries Ltd.
Geestland	3.2.76	P. W. Groves	R. H. Mason, C. J. Flanagan, I. M. Grant	I. D. Soumdy	Geest Industries Ltd.
Geeststar	30.12.75	D. Boon	W. A. Boddinton, M. F. Tomlinson, A. Bourn	A. Selmec	Geest Industries Ltd.

Geest-Tide	26.1.76	O. Springett	D. T. Evans, C. J. Flanagan, K. M. R. Skinner	D. Letcher	Geest Industries Ltd.
Gela	*	L. Staines	M. Marco, M. Bellamy, P. Murray	P. Bidmead	Sir Wm. Reardon Smith & Sons Ltd.
Gene Trefethen	30.12.75	I. L. Stevens	T. J. Proctor, R. Vinas, M. Minack	D. Hansdorff	International Ore Carriers Ltd.
Gladiola	*	C. R. Knight	I. M. M. Browne, A. Hammond		I.F.R. Services Ltd.
Gladstone Star	12.9.75	J. G. King	R. James, P. A. Suckling, K. Wadia	F. Blythe	Blue Star Line Ltd.
Glasgow Clipper	16.3.76	A. Cope			Whitco Marine Services Ltd.
Glenfalloch	28.10.75	W. E. Bellamy	J. B. Garner, R. C. McClelland, M. G. Fennell	R. Magowan	Ocean Transport & Trading Ltd.
Glenlyon	24.2.76	A. Mackenzie	A. K. Datta, A. J. Leslie, A. J. Lloyd	M. H. Kinley	Ocean Transport & Trading Ltd.
Glenmoor	26.3.75	W. Mathers	N. McLaughlin, J. Hutton, A. Simson	J. A. Notley	Anchor Line Ltd.
Glenogle	31.12.75	P. J. Broomfield, R.D.	D. J. D'Costa, F. R. Barry, D. S. Walker	D. G. Gunning	Ocean Transport & Trading Ltd.
Glenpark	7.3.75	A. T. Johnston	C. Mallett, R. F. Shea, R. Tavaro	R. J. McNurtry	J. & J. Denholm Ltd.
Gloxinia	25.2.76	R. J. Freeman	E. B. Bertelsen, J. Williams, S. Andrucci	S. Farmer	Stag Line Ltd.
Good Hope Castle	1.3.76	J. T. F. Broughton	D. P. Colley, R. S. Case, J. S. Price	R. A. Wilson	Union-Castle Mail S.S. Ltd.
Goth	14.1.76	J. N. Kerr	R. Spall	R. Spall	British United Trawlers Ltd.
Gothland	9.12.75	D. Lamont	E. Stout, W. Johnston, D. Carlton	D. J. Elmer	Currie Line Ltd.
Grafton	*	W. Council	R. Kenchington, P. Swift, M. McGowan	D. L. Wrex	P. & O. S.N. Co.
Halifax Star	2.3.76	R. McDonald			Blue Star Line Ltd.
Hausa	27.2.76	P. Donoghue			British United Trawlers Ltd.
Hazelbank	31.12.75	D. M. Maclean	G. Copping, M. Thompson, C. Notman	S. W. Pearson	Bank Line Ltd.
Hazelmoor	12.6.75	J. Williamson	A. MacInnes, R. M. Logan, W. Johnston	B. Holmes	Walter Runciman & Co. Ltd.
Hemifusus	28.1.76	R. Greig	J. S. Mercer, B. J. Keane	J. Duncan	Shell Tankers (U.K.) Ltd.
Hemimactra	17.3.76	C. Hindes	A. Kelly, T. P. Hughes, A. P. Willmore	O. Glenn	Shell Tankers (U.K.) Ltd.
Herefordshire	8.3.76	A. Lightfoot	D. C. McDowell, R. Milton, P. Helsby	P. Stanway	Bibby Line Ltd.
Hinea	21.1.76	R. Palmer	E. Alikhani, J. L. Ross, J. B. Edwards	S. S. Samab	Shell Tankers (U.K.) Ltd.
Historian	24.2.76	I. Mitchell	J. R. Leslie, K. Lancaster, D. Selvan	H. G. Sparkes	T. & J. Harrison Ltd.
Hobart Star	17.2.75	E. G. Bee	W. F. Hughes, R. Durham, C. A. F. Ledsam	J. Ryan	Blue Star Line Ltd.
Iberic	31.12.75	J. J. Rutter	D. M. Cambridge	L. J. Anderson	Shaw Savill & Albion Co. Ltd.
Ibn Rushd	*	W. Seybold	A. Alnaibari		Kuwait Shipping Co. (S.A.K.)
Icenic	5.2.76	F. G. Boize	A. Temperley, I. Alexander, W. J. Barclay	F. E. Page	Shaw Savill & Albion Co. Ltd.
Illyric	11.2.76	J. R. Richmond	R. Jones, W. Downing, M. Scanlan	J. Breen	Shaw Savill & Albion Co. Ltd.
Inverbank	7.2.74	D. L. Young	H. MacDonald, M. K. McLeod	P. N. Draper	Bank Line Ltd.
Ionic	31.10.75	M. J. Clark	M. J. Bishop, B. Norton, B. Bloxham	J. Buchanan	Shaw Savill & Albion Co. Ltd.
Irisbank	27.8.74	P. H. Thomas	P. E. Morrant, R. Snape, A. N. Watson	J. M. Delaney	Bank Line Ltd.
Jamaica Producer	15.3.76	M. C. Harper	K. Johnstone, A. Barker, P. McDaniel	J. J. Kennedy	Kay, Son & Co. Ltd.
Jedforest	11.3.76	D. A. Lambell	P. S. Cotgrove, N. F. Harris, J. N. Balkwill	J. E. Whiteman	P. & O. S.N. Co.
Jervis Bay	13.1.76	J. S. Thorpe	D. Wilson, B. Graham, C. Wise	M. H. Joniec	Container Fleets Ltd.
John Biscoe	24.4.75	E. M. S. Phelps	M. L. Shakesby, D. Bray, P. Clarke-Halifax	R. Wade	British Antarctic Survey
John Murray	25.11.74	G. Long	B. A. Chapman		Natural Environment Research Council
Junella	*	A. Eagle	R. Smith	R. Smith	J. Marr & Son Ltd.
Kano Palm	29.8.75	G. Morris	J. E. Turner, A. B. W. Chambi, M. Eckford	J. Fitzgerald	Palm Line Ltd.
Kelt	*	E. McCoid	H. C. L. Taylor	H. C. L. Taylor	British United Trawlers Ltd.
King Alfred	13.1.76	G. Beaumont	R. M. Raybould, P. Brown, I. M. Scott	W. Latus	Cayzer Irvine & Co. Ltd.
King George	*	R. J. Miller	A. C. Neville, B. B. Bougourd, C. R. Lisher	D. Wakeford	Cayzer Irvine & Co. Ltd.
King William	29.5.75	E. J. E. Owen	R. A. Hamilton, P. D. R. Kemp, D. J. Lewington	P. Hammond	Cayzer Irvine & Co. Ltd.
Kowloon Bay	17.3.76	J. Bentley	S. T. Houldsworth, P. Dodge, L. Aye Maung	D. Griffith	Ocean Transport & Trading Ltd.
L.N.G. Challenger	12.6.75	C. G. Hunt	T. W. Morey, T. James, A. J. Lewis	V. Oram	P. & O. S.N. Co.
La Loma	9.12.75	B. Wilcock	N. P. Iyer, M. O. Gyles, M. N. Baddeley, J. R. Hunt	L. Edgecombe	Buries Marks Ltd.
Lancashire	*	R. Weir	N. Marshall, P. Bytheway	W. Ferry	Bibby Line Ltd.
Laomedon	4.2.76	J. P. Wishart	A. J. Simons, A. L. Crowe, J. M. K. McPherson	R. F. Walsh	Ocean Transport & Trading Ltd.
Laurentian Forest	20.1.76	A. Mitchell			Harrisons (Clyde) Ltd.
Laurentic	10.1.75	M. Larrive	E. T. Hawkins, J. B. Fowler, R. B. Perks	D. Cooper	Shaw Savill & Albion Co. Ltd.
Letchworth	24.2.76	A. Hurst	R. Hurst, D. Weighill, T. Kent	D. Zeeman	R. S. Dalgliesh Ltd.
Leven Fisher	11.7.75	I. J. Groundwater	P. Kolinsky	C. F. Sheridan	James Fisher & Sons Ltd.
Limpsfield	25.2.76	I. S. M. Condie	P. J. Green, J. B. Brown, J. N. Ramsay		Shaw Savill & Albion Co. Ltd.
Liverpool Bay	11.3.76	R. J. Paterson	D. M. Illingworth, K. J. Owen, D. S. Todd	A. E. Holman	Ocean Transport & Trading Ltd.

Selected Ships (*contd.*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Loch Maree	•	D. Dickson	C. Reeves, A. Jones, C. W. Harvey		J. & J. Denholm Ltd.
London Cavalier	10.10.75	O. Connor	R. E. Gibson, K. Horsley, R. Fullagar	P. O'Neill	London & Overseas Freighters Ltd.
London Fusilier	•	W. W. Brown	G. J. Smith, D. J. Smith, C. Overall	G. McKinstry	London & Overseas Freighters Ltd.
London Pioneer	26.2.76	P. Wright	M. Caffrey, C. Davidson, M. Webber	P. Barber	London & Overseas Freighters Ltd.
Lord Strathcona	26.10.72	M. H. Scott	A. J. Malgarin, P. C. H. Adair	J. Lawrie	Canadian Pacific (Bermuda) Ltd.
Lossiebank	10.2.76	A. S. Reed	S. C. Collier, D. P. Monks	T. E. Bint	Bank Line Ltd.
Lutetian	18.6.75	F. C. Richardson	S. Woodward, D. F. Norman, S. C. Lee	B. Sunter	Oregon S.S. Co. Ltd.
Maersk Cadet	•	J. C. Clark	G. N. Smith, D. P. Lawford, J. Laverick	J. McKinley	Maersk (U.K.) Co. Ltd.
Maersk Commander	•	F. Surtees	G. Walkinshaw, R. Copeland, C. Hemingway	C. Wicks	Maersk (U.K.) Co. Ltd.
Mahout	26.1.76	D. A. M. O'Byrne	M. W. Brown, R. C. Winlo, B. J. Woodward	D. J. Saunders	Cunard-Brocklebank Ltd.
Mahronda	23.9.75	H. Evans		D. E. Beech	Cunard-Brocklebank Ltd.
Mahsud	23.7.75	G. D. Symonds	I. R. Lewis, G. Heard, J. D. Cook	G. P. Coombe	Cunard-Brocklebank Ltd.
Maihar	•	W. H. C. Hicks	T. Judge, P. Pettitt, A. McCutcheon	C. Clarke	Cunard-Brocklebank Ltd.
Makaria	4.11.75	J. D. Pascoe	B. Luke, P. N. Hambleton, D. G. Wilcockson	G. G. Graham	P. & O. S.N. Co.
Manapouri	22.1.76	G. J. Savage	J. Potter, R. Dowse, A. R. Pugh	G. Hetherington	P. & O. S.N. Co.
Manchester Challenge	10.12.75	J. McKay	M. C. Piercy, W. Williams, W. D. Porter	F. D. Farthing	Manchester Liners Ltd.
Manchester Concept	17.11.75	D. Smith	D. W. Milligan, R. A. Brown, R. M. Kieran	M. D. A. Walsh	Manchester Liners Ltd.
Manchester Concorde	9.2.76	P. N. Fielding	J. R. K. Tyson, C. Hiltunen, J. B. Turnbull	F. D. Farthing	Manchester Liners Ltd.
Manchester Courage	13.1.76	D. Thomas	I. Buckley, W. G. Anderson, J. F. Edwards	R. G. Campbell	Manchester Liners Ltd.
Manchester Crusade	11.3.76	D. S. Millard	D. Oliver, J. Mitchell, J. Rees	W. Stirling	Manchester Liners Ltd.
Manipur	2.2.76	D. Campbell	A. J. Turner, W. A. Pritchard, V. Garisau	P. Bradley	Cunard-Brocklebank Ltd.
Marabank	8.12.75	D. J. R. Davies	M. Waight, J. R. Brooks, S. P. Hockley	L. Robinson	Bank Line Ltd.
Maranga	29.9.75	M. C. Hollinsrake		R. Thirlby	Whitco Marine Services Ltd.
Markhor	24.3.75	G. F. Kay	R. W. Tappenden, A. C. MacCutchen, T. N. Dudman	V. G. Merriott	Cunard-Brocklebank Ltd.
Matuara	24.10.75	H. J. D. Sladen	T. M. North, A. W. Noble, C. Lewis	B. Keating	P. & O. S.N. Co.
Mayfield	13.11.75	J. Ferres	J. McKechnie, D. Lyon, J. Farrell	R. V. Price	Shaw Savill & Albion Co. Ltd.
Medic	14.10.75	W. W. Newport	T. Denyer, P. Wheatley, J. J. Hurley	S. Murphy	Shaw Savill & Albion Co. Ltd.
Megantic	9.12.75	R. E. Altham	S. Bligh, R. J. Hawkins, R. Wooding	G. S. Thomson	Shaw Savill & Albion Co. Ltd.
Melita	9.12.75	R. D. Leckie	M. J. Wright, D. Lemon, A. Brown	A. P. Rhind	P. & O. S.N. Co.
Menestheus	7.1.76	H. Davies	P. W. Boocock, A. J. Patton, J. R. Pearson	P. H. Allen	Ocean Transport & Trading Ltd.
Merchant	6.10.75	E. J. Maxwell	D. MacLeod, S. Fraser, J. B. Leggett	D. W. Cross	T. & J. Harrison Ltd.
Mercury	29.12.75	A. J. Fenwick	G. Bury, D. E. Rickards	D. Gallagher	Cable & Wireless Ltd.
Miranda	9.2.76	D. Y. Roberts	D. J. George, J. L. Moorby, G. Saul		Department of Trade
Mobil Condor	•	G. J. Robertson	M. H. McFarline		Mobil Shipping Co. Ltd.
Monksgarth	30.12.75	K. W. Keithley	J. Nixon, J. McIntosh, T. Naughton	C. J. Maharry	Ocean Transport & Trading Ltd.
Montreal Star	4.2.76	M. J. MacNeil	A. Lunn, J. P. Rogers, D. Barnicoat	R. Harvey	Blue Star Line Ltd.
Moreton Bay	13.1.76	P. J. Clark	R. D. Lorraine, Q. J. Murphy, T. R. Steel	W. F. Sheperd	Container Fleets Ltd.
Muirfield	•	M. C. John	I. Souter, P. Shaw, G. Walsham	A. Hodkinson	J. & J. Denholm Ltd.
Moraybank	1.12.75	P. M. Ireland	T. John, D. Gammons, H. Dillon	P. A. Richardson	Bank Line Ltd.
Nairnbank	18.9.75	D. G. McCaffery	S. P. Hockley, C. C. W. Towne, N. K. MacDonald	P. T. Fort	Bank Line Ltd.
Naworth	6.8.75	J. S. Wisden	M. Mahendra	P. T. Murphy	R. S. Dalgliesh Ltd.
Newfoundland	15.8.75	C. Rowntree	E. F. Giles, P. Weldon	G. M. C. Duncan	Furness Withy & Co. Ltd.
New Westminster City	2.10.74	A. L. G. Gosset	J. Paton, M. E. Jones, G. Mapplebeck	C. G. Macey	Sir Wm. Reardon Smith & Sons Ltd.
New Zealand Star	28.10.74	N. Johnson	M. J. Selby, T. Black, B. Penrose	G. Simmons	Blue Star Line Ltd.
Nina Bowater	11.3.76	B. S. Biggs	S. H. Cant, R. Kendall, F. Murray	D. P. Kennedy	Cayzer Irvine & Co. Ltd.
Nordic Commander	•	E. Warman	—. Cummings, —. Robson	—. Marsden	J. & J. Denholm Ltd.
Nordic Talisman	2.2.76	D. T. Jackson	R. F. Shea, L. P. Allatt, M. H. Savage	W. Hughes	J. & J. Denholm Ltd.

Norman Lady	13.1.76	G. Willis	M. G. Phipps, D. Wilson, G. Mathews	H. Bahn	Buries Marks Ltd.
Norse	18.2.76	R. Waller	A. Ramsay	A. Ramsay	British United Trawlers Ltd.
Norse Marshal	24.1.75	A. Barker	N. Stark, H. Seyd		Harrisons (Clyde) Ltd.
Norse Trader	2.10.74	E. Muir	H. Churchill, J. W. Parkinson, A. C. Wilson	J. B. Carter	Harrisons (Clyde) Ltd.
Norse Viking	18.2.76	M. B. Bradley	N. H. Cooper, P. G. Ramm, R. Hurst	R. F. Collins	Cardigan Shipping Co. Ltd.
Nova Scotia	3.12.75	S. D. Gibson	P. Quayle, R. Crawford	J. A. Foreman	Furness Withy & Co. Ltd.
Novelist	3.9.75	J. Maddison	D. W. Brennan, J. N. Brook, A. K. Shaw	R. B. Cooper	T. & J. Harrison Ltd.
Oakworth	5.12.74	J. S. Wisden	H. F. Bond, N. O. Morrice, M. Mahendra	K. Brennan	R. S. Dalgliesh Ltd.
Ocean Bridge	12.3.76	M. G. King	G. Rosie, J. B. Williams, R. Webster	J. E. Harding	Bibby Line Ltd.
Opalia	12.3.76	R. W. Lumsden	C. D. Bull, R. Firth, R. Strick	P. P. Cuffe	Shell Tanker (U.K.) Ltd.
Orbita	12.11.75	R. K. C. Thomas	G. P. Jones, I. Middleton, S. D. Bell	J. Hickinbotham	Pacific S.N. Co. Ltd.
Orcoma	26.8.75	G. E. Turner	P. C. Shone, D. Bridgman, T. F. Hill	W. A. Rance	Pacific S.N. Co. Ltd.
Orduna	4.11.75	R. T. Riley			Pacific S.N. Co. Ltd.
Orenda Bridge	15.5.75	C. J. Welch	R. C. Brooker, K. P. Campbell	D. W. Martin	Ore Carriers Ltd.
Orotava	8.3.76	B. C. Tyler	R. V. Hooley, N. Holland-Lloyd, R. M. P. Nykolyszyn	S. N. Kelly	Ore Carriers Ltd.
Orsino	*	R. Spenser	A. Rodskjaer	A. Rodskjaer	British United Trawlers Ltd.
Ortega	6.12.74	C. W. Alison	M. K. Lee, E. Jones, S. Szaraletta	G. Waller	Pacific S.N. Co. Ltd.
Osaka Bay	17.2.76	M. Lees	W. G. C. Wallace, H. T. Reid, S. Brown	R. D. Cause	Ocean Transport & Trading Ltd.
Otaio	2.2.76	F. G. Bevis	D. C. Fickling, C. Baker, J. G. Melrose	C. Anderson	P. & O. S.N. Co.
Othello	13.1.76	J. C. Lilley	W. Jopling, G. Petty, A. Mann	J. D. Booth	Hellyer Bros. Ltd.
Partula	21.1.76	G. C. R. Waddell	P. M. Malling, L. W. M. Van-Burken, P. J. Talbot	S. Korgaonkar	Shell Tankers (U.K.) Ltd.
Patroclus	15.1.76	H. O. Williams	A. H. Price, D. L. Batchelor, P. Singh	M. J. Walker	Ocean Transport & Trading Ltd.
Pegu	10.10.75	J. McGechen	M. Bagley, B. H. M. M. Kahil	M. Atherton	Ocean Transport & Trading Ltd.
Peisander	28.10.75	D. L. Emery	M. Rudrakumar, W. Broadbent	E. J. Emmett	Ocean Transport & Trading Ltd.
Pendennis Castle	4.2.76	T. S. Catterall	M. Johnson	R. Mercer	Union-Castle Mail S.S. Co. Ltd.
Perseus	3.9.75	A. M. Blackburn	P. A. Joss, P. S. Todd, P. M. Watt	P. M. Weldon	Ocean Transport & Trading Ltd.
Phemius	24.10.75	R. J. Paterson	R. M. Selvarajah, G. J. Roberts	J. N. Shirley-Fox	Ocean Transport & Trading Ltd.
Philosopher	6.2.76	R. B. Simmons	J. A. Cook, G. M. Hunt, K. Pearce	D. Murphy	T. & J. Harrison Ltd.
Photina	11.7.75	L. Hopper	J. B. Young, K. Hughes, S. Alderson	E. J. Davies	Stag Line Ltd.
Phrontis	6.10.75	A. S. Thompson	B. A. K. Zaman, J. G. D'Araujo	R. Stevens	Ocean Transport & Trading Ltd.
Piako	29.1.76	D. V. Harradine	R. M. Hughes, R. Gordon, D. Knight	K. Lacey	P. & O. S.N. Co.
Plainsman	13.2.76	R. Taylor	A. C. McMillan, M. Camm, J. Fletcher	J. Buchanan	T. & J. Harrison Ltd.
Port Alberni City	28.1.76	P. J. Boroughs	W. Premier, J. Lynch, T. Haxel	J. R. Mathews	Sir Wm. Reardon Smith & Sons Ltd.
Port Alfred	2.7.75	P. R. R. Ramsay	C. Latham, A. Helme	F. Tordoff	Port Line Ltd.
Port Auckland	15.1.75	D. Sinclair	J. Hooper, R. Langmuir, I. C. Bevis	M. Fitzgerald	Port Line Ltd.
Port Caroline	3.9.75	W. J. Williams			Port Line Ltd.
Port Chalmers	2.2.76	P. R. R. Ramsay	J. E. Atkins, J. M. Bowie, N. B. Bamford	J. Barlow	Port Line Ltd.
Port Launceston	23.10.75	T. G. S. Ward	I. R. Lewis, M. Thwaite, P. R. Fawcett	J. Guthrie	Port Line Ltd.
Port New Plymouth	11.12.75	M. L. Coombs			Port Line Ltd.
Port Nicholson	11.7.75	J. M. Read	A. P. Haxby, J. Jones, I. C. Bevis	P. Bradley	Port Line Ltd.
Post Champion	12.9.75	K. Lewis	R. Regan, A. Child, D. J. Williams	N. E. Sayle	Panocean Shipping & Terminals Ltd.
Post Charger	5.12.75	E. I. Grant	G. W. Bowles, S. C. Floate, C. C. Rackham	R. Routledge	Panocean Shipping & Terminals Ltd.
Post Chaser	16.1.76	K. Lewis	C. Whale, D. Tearle	J. Briggs	Panocean Shipping & Terminals Ltd.
Post Endeavour	2.3.76	A. K. Froggatt	S. W. Bowles, P. J. H. Russi, L. Geldabd	D. Jackson	Panocean Shipping & Terminals Ltd.
Post Runner	4.11.75	G. L. Milburn	J. N. Balkwill, R. J. Lee, R. B. Cox	K. Wilson	Panocean Shipping & Terminals Ltd.
Priam	13.2.75	D. L. Emery	Ang Chin Eng, J. C. Cox, P. A. Smith	W. Britton	Ocean Transport & Trading Ltd.
Prince Rupert City	18.4.75	D. B. Jack	C. Kelly, D. J. A. Nicholl, M. C. Ingram	D. Edge	Sir Wm. Reardon Smith & Sons Ltd.
Prometheus	29.10.74	A. S. Thompson	J. M. Good, A. G. Watson, A. Shukor	S. D. Price	Ocean Transport & Trading Ltd.
Protesilaus	2.10.75	W. P. Goldie	W. B. Westwood, A. Leach, G. Begley	E. E. Milburn	Ocean Transport & Trading Ltd.
Queen Elizabeth 2	18.11.75	M. Hehir	P. Buckley, D. Carr, R. Warwick	D. H. Butterworth	Cunard S.S. Co. Ltd.
Queensgarth	13.1.76	L. Kruzins	P. Heywood, J. Davies, J. Greene	P. Alexander	Ocean Transport & Trading Ltd.

Selected Ships (*contd.*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Raeburn	20.1.76	N. L. Mylchreest	S. J. Mortland, R. Wright, J. Mockett	J. Fraser	Blue Star Line Ltd.
Raphael	24.2.76	R. Bilton	P. R. Maudsley, G. Rawding		Lamport & Holt Line Ltd.
Recorder	*				Cable & Wireless Ltd.
Remuera	20.2.76	J. Cosker	L. J. Fletcher, D. Tracey, S. Smith	S. Braithwaite	P. & O. S.N. Co.
Rockhampton Star	19.11.75	S. Williams	J. V. Daymond, P. Tann, K. Pykett	R. Kit	Blue Star Line Ltd.
Romney	12.5.75	M. J. MacNeil	A. L. Stout, C. Bufton, C. A. Roy	C. S. Currie	Lamport & Holt Line Ltd.
Ronsard	16.12.75	W. A. Wilson	D. Iggo, D. Granderton, L. A. Lezameta	R. Prole	Lamport & Holt Line Ltd.
Rosemary Everard	12.11.73	J. P. Skinner	T. L. Jeffery		F. T. Everard & Sons Ltd.
Ross Orion	4.3.76	A. Osler	R. R. N. Laing	R. R. N. Laing	Hudson Bros. Trawlers Ltd.
Rowanbank	28.5.75	B. F. C. Bennett	D. Lorimer, M. Trimble, R. Greener	M. Hester	Bank Line Ltd.
Rudby	15.8.75	F. A. Carter	A. Willing, N. Jenkins, H. Towers	A. C. Cawdery	Sir R. Ropner & Co. Ltd.
St. Jason	18.2.76	A. Ball	H. G. Pask	H. G. Pask	T. Hamling & Co. Ltd.
Sara Lupe	12.12.75	J. J. Kalnins	P. P. Rowland, J. Ross, B. J. Barlett	D. Edge	Sir Wm. Reardon Smith & Sons Ltd.
Scholar	*	R. Simmons	P. B. Mimmack, P. W. Wray, J. Blakeley	M. Donaldson	T. & J. Harrison Ltd.
Scotia	12.9.74	P. S. Burn	A. Main, W. Henderson, W. Laws	J. MacIntyre	Dept. of Agriculture & Fisheries for Scotland
Scotspark	5.8.75	A. Johnston			J. & J. Denholm Ltd.
Severn Bridge	6.3.75	D. MacDonald	R. MacLeod, F. O. Wahutu, L. K. Jaffer	E. Kilkenny	J. & J. Denholm Ltd.
Shackleton	20.11.75	P. H. Warne	J. Jones, P. Morgan, J. Evans	R. G. Alexander	Natural Environment Research Council
Sheaf Tyne	7.11.75	A. Clish	N. D. Riley, J. M. Bullard, P. B. Marshall	R. G. Miller	W. A. Souter & Co. Ltd.
Sherbro	25.2.76	J. M. Johnston	B. W. Jamaluddin, P. A. E. Sambrook, M. J. Knight	J. J. Crotty	Ocean Transport & Trading Ltd.
Shonga	14.1.76	D. Howe	P. Harwood, R. Murray, J. G. W. Dixon	J. Nolan	Ocean Transport & Trading Ltd.
Sig Ragne	23.7.75	H. McDonald	W. H. Orgill, M. T. Woolliscroft, L. B. Gibson	F. Wilson	J. & J. Denholm Ltd.
Silverdon	3.3.76	A. Smith	M. A. Whittle, A. Peacock, M. Holbrook	M. Teasdale	Silver Line Ltd.
Silverfjord	23.11.73	J. W. Whitelaw	A. M. Campbell, P. Lewis, C. Macleod	B. C. Bull	Silver Line Ltd.
Silverforth	26.2.76	C. Forth	N. F. H. Fenwick, A. McGibbon, M. H. Witkowski	S. L. Bell	Silver Line Ltd.
Silvermain	10.12.75	N. Tuddenham	D. Murray, N. C. I. Despon, J. C. Oxenham	K. Roberts	Silver Line Ltd.
Silver Pit	9.3.76	H. Hernar			Marine Exploration Ltd.
Sincerity	1.10.74	H. Brown	I. Hay		F. T. Everard & Sons Ltd.
Sir William Hardy	1.1.71	J. A. Whittleton		A. W. Stephen	Ministry of Technology
Skagerak	18.2.76	B. Darwell	J. Halls, J. Tulley		Marine Exploration Ltd.
Somerset	28.1.76	T. C. Mathews	N. R. G. Robinson, E. M. Robertson, S. R. Matthews	R. P. Murt	P. & O. S.N. Co.
Somerset Maugham	25.11.75	E. R. Woolridge	M. Allison		Newington Trawlers Ltd.
Southampton Castle	17.3.76	C. D. Hedges	S. M. Gobbi, D. J. Mercer, M. R. Brown	D. A. P. Galbraith	Union-Castle Mail S.S. Co. Ltd.
Southland Star	29.4.75	W. A. Davidson			Blue Star Line Ltd.
Spraynes	*				Jebsens (U.K.) Ltd.
Star Blackford	28.1.76	D. J. Orr	A. P. Terris, D. Wharton, D. W. Keighley	J. Flick	Blandford Shipping Co. Ltd.
Star Bulford	10.4.75	J. Hinchcliffe	R. B. Middleton	A. O. O'Carrol	Blandford Shipping Co. Ltd.
Stephano	19.1.76	K. J. Lyall		D. J. Wallen	Bowring S.S. Co. Ltd.
Stirling Bridge	12.12.75	D. MacDonald	D. A. Raynor, D. Mands, I. McKendrick	F. Wilson	J. & J. Denholm Ltd.
Strathaddie	31.10.75	M. A. Hill	L. C. Dharmani, R. Fletcher, B. B. Curem	D. M. Matheson	P. & O. S.N. Co.
Strathaird	2.8.73	R. L. Cain	D. P. Ploughman, W. B. Johnston, M. Blacklock	E. Marks	P. & O. S.N. Co.
Strathairlie	1.10.75	R. G. Dando	A. K. Singh		P. & O. S.N. Co.
Strathalvie	28.10.75	A. W. Jones	B. J. Kirtley, S. K. Chaudhary, R. S. McWilliam	D. C. Clarkson	P. & O. S.N. Co.
Strathangus	9.12.74	L. Seddon	G. C. Stonehouse, J. G. Jackson, B. B. Curem		P. & O. S.N. Co.
Strathanna	29.7.75	R. C. Lister	N. I. Blacker, J. Jewell, P. Laycock	S. Ludgate	P. & O. S.N. Co.

Strathappin	12.8.75	G. L. Andrews	P. J. Goadby, R. G. Tull, A. B. Parry	G. Hetherington	P. & O. S.N. Co.
Strathardle	14.10.75	R. Hodgson	T. M. Grime, P. R. Owen, P. C. Dyer	Y. C. Lo	P. & O. S.N. Co.
Stratharlick	1.9.75	P. W. Filcek	D. H. Ayris, D. J. Goodwin, G. L. Pettinger	G. Palmer	P. & O. S.N. Co.
Strataros	10.11.75	M. J. Charlesworth	T. R. Bennett, J. S. W. Dyson	R. Willcocks	P. & O. S.N. Co.
Strathaslak	18.11.75	B. G. McKerrell	T. L. Leuty, A. Savur, D. Castelino	S. Oliver	P. & O. S.N. Co.
Strathassynt	10.2.75	M. H. Wilson	P. C. Smart, P. Davies, D. Koronjo	J. Simpson	P. & O. S.N. Co.
Strathatlow	18.8.75	A. M. J. Jenkins	P. B. Young, K. K. Good, R. C. Bloomfield	J. Simpson	P. & O. S.N. Co.
Strathavoch	11.12.75	P. M. Pitcairn	S. White, S. R. Kelkar, D. H. Lacey	P. F. Tennet	P. & O. S.N. Co.
Strathbrora	22.3.76	A. Dorkins	M. J. Haggarty, S. M. Patel, C. E. A. Barnes		P. & O. S.N. Co.
Strathconon	16.12.75	G. C. Woolgar	M. Ross, S. N. Monks, S. Kocherla	P. H. Wong	P. & O. S.N. Co.
Strathdevon	21.1.76	F. C. Taylor	D. S. Conley, I. Roberts, A. Fateh	C. Fyall	P. & O. S.N. Co.
Strathinch	27.10.75	N. Luck	R. J. Kingsnorth	D. L. Lacey	P. & O. S.N. Co.
Strathinver	18.11.75	A. C. R. Murray	D. Caplain, J. Jackson, M. Rooker	I. Forster	P. & O. S.N. Co.
Strathirvine	10.12.75	R. Ogilvy	A. Betts, V. K. Gadhok, D. G. Pugh	J. R. Orr	P. & O. S.N. Co.
Strathlauder	23.9.75	F. L. Heard	N. D. Graham, D. MacDonald, H. T. Kyi	J. W. Scott	P. & O. S.N. Co.
Strathleven	16.7.75	R. A. G. Windle	D. G. Foreman, C. A. Yates, G. B. Hall	E. Chlechowicz	P. & O. S.N. Co.
Strathlomond	27.2.76	W. G. Howcroft	D. J. Pratt, G. W. McInnes, K. V. Jolly	D. A. Hunt	P. & O. S.N. Co.
Strathnairn	21.10.75	J. H. B. Weston	S. M. Millar, P. Grimes, C. S. Longford	G. Kraus	P. & O. S.N. Co.
Strathnaver	9.2.76	P. Lay	I. Clark, W. F. Harris, D. P. Ploughman	A. Archibald	P. & O. S.N. Co.
Strathnevis	26.11.74	R. D. Cookman	J. D. Haynes, I. Anderson, N. C. Davidson	B. J. Britton	P. & O. S.N. Co.
Strathnewton	6.8.75	C. Monk	S. R. Mathews, C. Tutty, I. Khara	J. Evans	P. & O. S.N. Co.
Strathtay	10.12.75	G. E. Harris	D. H. Plumer, R. Lorains, H. T. Kyi	M. Charlton	P. & O. S.N. Co.
Strathteviot	10.11.75	J. W. Cole			P. & O. S.N. Co.
Strathtruim	30.1.76	M. S. Gordon	P. Gregson, D. Aga, C. V. Umrigar	R. J. Woodward	P. & O. S.N. Co.
Sugar Carrier	1.12.75	J. E. Leaver	E. Varne, T. J. O'Connell, W. Brothers	T. Fortune	Sugar Line Ltd.
Sugar Crystal	9.3.76	D. Patrickson	R. E. Shore, W. H. Walker, D. M. Buck	O. Ismail	Sugar Line Ltd.
Sugar Exporter	11.2.76	G. Pirie	F. J. Marks, F. Strachan, W. Paterson	B. I. Bicknell	Sugar Line Ltd.
Sugar Importer	3.9.75	D. Patrickson	M. R. Harris, J. Ford	D. W. Zeeman	Sugar Line Ltd.
Sugar Producer	19.1.76	F. E. Brown	P. Helm, A. Longbottom, E. Houghton	J. Gibson	Sugar Line Ltd.
Sugar Refiner	15.1.76	C. N. L. Davies	R. N. Franklin, L. Piper, G. Leith	C. Hawkridge	Sugar Line Ltd.
Sugar Trader	12.6.75	P. Sutcliffe	P. J. Leech, G. A. Bisacre, G. P. Ansell, T. Smith	G. Cracknell	Sugar Line Ltd.
Sugar Transporter	1.9.75	W. Shirreff	M. I. J. Carrol, E. Windsor		Sugar Line Ltd.
Summity	11.3.76	W. G. Hunt	G. D. Goulding, I. C. Hay		F. T. Everard & Sons Ltd.
Supremity	18.2.76	P. L. Whitehouse	B. Priddis, T. H. Withers		F. T. Everard & Sons Ltd.
Sussex	3.9.75	D. Calvert	D. Carpenter, S. Parker, W. Pointon	J. Crampin	P. & O. S.N. Co.
Swedish Wasa	•	J. F. Adams	M. J. Pinder, B. H. Bailey, J. Bashforth		Whitco Marine Services Ltd.
Sydney Bridge	28.8.74	P. B. Robier		B. Young	Bowring S.S. Co. Ltd.
Tacoma City	5.11.75	J. Cann	P. J. Godding, P. G. Deschamps, J. R. Ashley	E. A. Willocks	Sir Wm. Reardon Smith & Sons Ltd.
Tactician	11.9.75	T. A. Butler	T. G. Bailey, T. M. Fitzpatrick, M. Arden	A. P. G. Gray	T. & J. Harrison Ltd.
Tamworth	15.10.75	A. Mathison	H. F. Bond, P. M. C. Morris	N. R. Hadley	R. S. Dalgliesh Ltd.
Tantalus	17.2.76	I. I. Laing	J. Mahoney, J. Cartwright, G. Evans		Ocean Transport & Trading Ltd.
Taupo	1.10.75	J. M. Burn	K. H. Davie, D. Goodwin, C. J. Price	M. J. Ellis	P. & O. S.N. Co.
Teesside Clipper	30.1.76	T. A. Ireland	T. A. Pringle, A. E. Hicks, A. M. Oxberry	D. Russell	Whitco Marine Services Ltd.
Tekoa	18.2.76	S. T. S. Household	R. P. Lonsdale, B. Penman, J. T. Jenkins	C. Gamwell	P. & O.S. N. Co.
Temple Arch	15.1.76	L. W. Tait	K. V. Bhandarkar, T. B. Miller, P. W. Kirkby	D. V. Large	Whitco Marine Services Ltd.
Temple Bar	7.12.73	A. M. Fraser	H. Aitchinson, J. H. Jenkinson, I. J. Waters	G. Walker	Scottish Ship Management Ltd.
Teviotbank	9.5.74	H. J. Taylor	A. Watson, S. Ramage, R. K. Pitt	C. Lockwood	Bank Line Ltd.
Texaco Brussels	15.1.76	G. M. Smith	M. J. Perry		Texaco Overseas Tankship (U.K.) Ltd.
Texaco Gloucester	27.1.76	P. Stead	A. Monteath, C. Rose, A. Day	S. Kavannagh	Texaco Overseas Tankship (U.K.) Ltd.
Texaco Singapore	9.7.68	R. G. A. Barnes	R. A. Russell, J. Campbell, R. R. Brooks	G. Cockburn	Texaco Overseas Tankship (U.K.) Ltd.
Timaru Star	1.10.75	G. Bowden			Blue Star Line Ltd.
Tokyo Bay	29.1.74	D. T. MacLachlan	J. L. Wilson, P. F. Robinson	P. A. Gooch	Ocean Transport & Trading Ltd.
Tongariro	15.3.76	E. F. H. Allen	W. D. Saarsteiner, N. Horobin, R. J. Major	E. Jennings	P. & O. S.N. Co.

Selected Ships (*contd.*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Townsville Star	8.3.76	J. G. Reeve	S. K. Pollat, M. D. S. Shariff, D. J. Jones	R. Greaves	Blue Star Line Ltd.
Trader	5.2.76	G. Lovell	D. W. Brennan, S. D. Elias, R. A. Bourne	P. Dennehy	T. & J. Harrison Ltd.
Trent Wood	14.1.76	P. Hansen	K. J. Geiss J. Huston, M. Wolf	D. Barry	International Ore Carriers Ltd.
Troll Park	4.6.75	A. Blackie	R. Smeaton, E. Hafezi	M. Cartal	J. & J. Denholm Ltd.
Turakina	24.10.75	J. F. Milner	D. J. Kirkham, P. I. Hillman, C. F. Campbell	A. D. MacGillivray	P. & O. S.N. Co.
Uganda	12.9.75	G. C. Barrett	R. J. A. Brook-Hart, R. Richardson, M. Fowler	A. Brown	P. & O. S.N. Co.
Ulster Star	24.9.75	J. Howorth	C. J. Poulter, M. Rowley, M. Moorhouse	R. J. Nolan	Blue Star Line Ltd.
Vancouver City	29.5.75	T. W. D. John	P. C. Roberts, R. G. Hayton, J. Sharples	J. R. Mathews	Sir Wm. Reardon Smith & Sons Ltd.
Vancouver Forest	10.12.75	N. Campbell	N. J. W. Kaye, D. R. Perry, E. Henderson	M. Hill	J. & J. Denholm Ltd.
Vancouver Island	7.11.75	R. Frater	A. S. Kelly, D. Duff, A. Fernandes	D. Bradshaw	J. & J. Denholm Ltd.
Vancouver Trader	3.7.75	P. Shanyer	R. M. I. Smith, D. M. Carmichael, D. J. Glenn	P. Dempsey	J. & J. Denholm Ltd.
Varda	20.9.73	G. Carmichael	K. Gelly, J. Henderson, D. J. Smith	D. Wilkinson	Haverton Shipping Ltd.
Venassa	20.11.75	B. Wilkinson	N. Howard, A. T. Donaldson, R. Weeks	J. B. Pinto	Shell Tankers (U.K.) Ltd.
Vendee	31.12.75	D. H. Roberts	I. Anderson, D. J. Perry	E. Marks	P. & O. S.N. Co.
Vickers Viking	*	J. Johanson	L. Sutherland, T. Jones	J. C. Yates	James Fisher & Sons Ltd.
Vickers Viscount	*	A. Mellor	J. Lawson, G. Smith	R. I. Anshon	James Fisher & Sons Ltd.
Vickers Voyager	*	L. Edwards	J. Smith		James Fisher & Sons Ltd.
Victore	20.2.76	C. Newsome	C. Archer, I. P. T. Mathias, D. L. Thomas	R. Cunningham	Mavroleon Bros. Ltd.
Victoria City	20.1.76	G. S. Garlick	J. Paglar, M. J. Bellamy, A. M. Young	W. Cameron	Sir Wm. Reardon Smith & Sons Ltd.
Viking Vigilant	18.6.75	M. H. Hobbs	T. Victory, T. Ginn		Vigilant Marine Ltd.
Vimeira	24.2.76	H. Churchill	D. J. McIntosh	E. Smith	Harrisons (Clyde) Ltd.
Vosges	*	G. Britain	H. W. Perry		P. & O. S.N. Co.
Warwickshire	27.8.75	R. Weir	S. Thomas, P. Kinkead, M. R. Robins	A. Melia	Bibby Line Ltd.
Welsh City	28.10.75	T. W. D. John	I. M. A. Stewart, D. H. Aubrey, H. H. Gale	B. J. Hill	Sir Wm. Reardon Smith & Sons Ltd.
Welsh Herald	2.12.75	T. L. Cook	G. L. Conlon, C. G. Lunny, R. C. Winn	K. Mulholland	Welsh Ore Carriers Ltd.
Westbury	9.3.76	J. C. Woodbridge	S. M. Hammond, J. Bletsoe, M. P. Seaney	A. K. Watson	Houlder Bros. & Co. Ltd.
Westmorland	30.12.75	P. W. Price	K. Milnes, M. Nicholson, K. Byrne	J. R. Sangster	P. & O. S.N. Co.
Westra	26.2.76	D. R. Corse			Dept. of Agriculture & Fisheries for Scotland
Whitethorn	4.11.75	H. S. Cully	D. B. Bramagh, A. Dohnan, D. C. A. King		S. William Coe & Co. Ltd.
Wild Auk	15.1.76	L. Quigley	P. C. H. Smith, A. Wilson, D. Carsey	R. Heath	P. & O. S.N. Co.
Wild Avocet	26.8.75	A. J. Field	M. A. Brown, D. Daniel, D. J. Tomkiss	B. T. Davis	P. & O. S.N. Co.
Wild Cormorant	15.5.75	I. Y. Batley	D. Daniel, G. Everitt, C. Marryat	G. C. England	P. & O. S.N. Co.
Wild Curlew	7.3.75	P. Lay	D. R. K. Vickers, W. D. Phimister, D. Dorman	J. F. A. Sharples	P. & O. S.N. Co.
Wild Fulmar	12.3.76	T. A. M. Lincoln	M. A. J. Underwood, D. A. Dornom, T. T. Veitch	R. Harris	P. & O. S.N. Co.
Willowbank	17.10.75	F. T. Rees	M. E. J. Turner, J. R. Smith, R. A. Witherden	A. J. Couper	Bank Line Ltd.
Wiltshire	11.9.75	M. J. Winter	S. R. Woodward, R. A. F. Edwards, P. Anderson	B. J. Foley	Bibby Line Ltd.
Wimpey Sealab	27.1.75	A. J. Stewart	M. G. Robinson, G. W. Hargreaves, A. Foster	R. M. Friswell	Wimpey Marine Ltd.
Windsor Castle	17.11.75	P. St. Q. Beadon	R. G. Head, S. J. Milnes, M. Birch	S. Harden	Union-Castle Mail S.S. Co. Ltd.
Woosung	29.10.75	A. L. Carter	S. W. Lim, R. P. Fairbrother, N. S. Rondina	Tsang Kau	China Navigation Co. Ltd.
Worcestershire	21.4.75	J. D. Routledge	D. W. McCluskey, R. F. Milton, D. Singh	J. D. Walsh	Bibby Line Ltd.
Yorkshire	8.3.76	J. S. Gavin	M. S. Brocklesby, B. Holcombe, N. H. Malpass, D. G. Marsh	C. Wade	Bibby Line Ltd.
Zealandic	28.1.76	S. C. Carr	I. C. Chandler, P. W. Garlick, J. W. Salter	T. Chambers	Shaw Savill & Albion Co. Ltd.

Supplementary Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Albrit	*	R. C. Hawkes	R. Pitt		Jeppesen Heaton Ltd.
Apollo	15.12.75	J. Earl	E. Foley, M. Tomlin, A. M. Jones		Bristol S.N. Co. Ltd.
Baltic Jet	*	M. de Lacy	J. Priestly, S. Williamson, T. Taylor		United Baltic Co. Ltd.
Baltic Star	2.9.75	A. Cooper	C. Jotcham, A. Dewar, F. G. Hardy	G. W. Shaw	United Baltic Co. Ltd.
Baltic Vanguard	26.1.76	J. C. Collins			United Baltic Co. Ltd.
British Fern	20.2.76	J. W. Bruce	P. M. Fido, A. Edwards	E. Fair	B.P. Tanker Co. Ltd.
City of Ankara	9.7.75	D. Williams	P. Bishop, J. Gurton, E. T. Sanor		Ellerman Lines Ltd.
City of Athens	6.2.76	A. R. Whittleton	R. Lyall, C. Dale, P. White		Ellerman Lines Ltd.
City of Delhi	21.5.73	K. G. MacLean	J. A. Fraser, D. Walker, M. G. Robertson	J. Noonan	Ellerman Lines Ltd.
City of Famagusta	12.8.75	G. Bryson	R. Innes, G. Watson, M. Robertson	B. Holdsworth	Ellerman Lines Ltd.
Decca Surveyor	*	T. Sheehan	H. Skelton		Oil Search Marine Management
Echo	31.12.75	W. R. Kaye	I. R. Boulton, S. O'Keefe, R. Smithson		Bristol S.N. Co. Ltd.
Eden Bridge	*	D. W. Bowen	P. Bawa, P. Cooke, M. Kennedy	D. Bradshaw	J. & J. Denholm Ltd.
Ilorin Palm	16.12.75	G. Morris			Palm Line Ltd.
Joseph Conrad	24.12.75	D. J. Burdett	G. Christmas		Newington Trawlers Ltd.
Lord Nelson	28.10.75	N. E. Longthorp			Hellyer Bros. Ltd.
Methane Princess	13.1.76	D. H. G. Mortimer	A. P. MacMillan, A. J. Andrews, A. J. Parnell	M. B. Ryan	Shell Tankers (U.K.) Ltd.
Methane Progress	15.8.75	D. Belk	T. A. Smith, W. Downs, T. Wheating	A. H. G. Wall	Shell Tankers (U.K.) Ltd.
Mobil Endurance	2.5.74	R. I. Philip	A. R. Evans, T. R. Parish, J. A. Eldred	P. V. Cagney	Mobil Shipping Co. Ltd.
Mobil Energy	23.7.73	R. D. Stevenson	L. M. Wright, M. Larkin	A. B. Crossland	Mobil Shipping Co. Ltd.
Mobil Pegasus	16.5.73	J. Millar	J. B. McGrath, G. Wrigley	R. J. Thompson	Mobil Shipping Co. Ltd.
Northern Reward	4.4.73	W. Harris	S. B. Barr	S. B. Barr	Northern Trawlers Ltd.
Oil Supplier	*	C. Cunningham	G. J. S. Ives, M. Kirk		Ocean Inchcape Ltd.
Orchidea	7.5.75	T. A. Ireland			I.F.R. Services Ltd.
Primella	13.1.76	P. Taylor	G. R. Smith	G. R. Smith	J. Marr & Son Ltd.
Researcher	*	J. W. Dunn	J. E. Thornton		Guardline Ltd.
Ross Canaveral	*	N. Redfern	A. Fulcher	A. Fulcher	British United Trawlers Ltd.
Ross Implacable	31.12.71	G. Whur	Chan Chi Yuen	Chan Chi Yuen	British United Trawlers Ltd.
Ross Sirius	14.1.76	D. Whiting	J. Wells		British United Trawlers Ltd.
Roybank	11.2.74	L. H. Wigham	J. F. Barkley, N. K. MacDonald, A. E. Scales	J. T. Clare	Bank Line Ltd.
St. Benedict	9.12.75	A. T. Blenkin	R. T. Murphy	R. T. Murphy	T. Hamling & Co. Ltd.
St. Giles	14.1.76	D. Platten	M. Stather, K. Ward		T. Hamling & Co. Ltd.
St. Jasper	14.10.75	E. J. Johnson	K. C. Stone	K. C. Stone	T. Hamling & Co. Ltd.
St. Jerome	*	J. Gibson	M. Morrow	M. Morrow	T. Hamling & Co. Ltd.
Scottish Wasa	27.9.74	T. G. Goldie	R. H. Jenkins, A. Kruum, R. Rutherford	J. Fudge	W. A. Souter & Co. Ltd.

Trawlers

The following is a list of trawler skippers and radio operators who voluntarily observe and report those elements of the weather which do not entail the use of any meteorological instruments (irrespective of the vessel in which they sail).

Skipper	Radio Operator	Owner/Manager
W. J. E. Boyle	A. Spence	Boyd Line Ltd.
D. Paterson	E. Witley	Hudson Bros. Trawlers Ltd.
T. W. Pembroke	B. H. Colley	British United Trawlers Ltd.
C. Walker	M. Allison	Boyd Line Ltd.
K. Westcott	B. H. Colley	British United Trawlers Ltd.

Light-vessels

Name of Vessel	Masters
Dowsing	A. Richards, F. Turner
East Goodwin	L. Mortimer, F. J. Shilling
Falls	W. Semple, A. H. Robinson
Galloper	H. R. Barnes, E. L. Jaeger
Humber	T. W. Grice, S. F. Goose
Newarp	L. R. Long, G. A. Harris
Royal Sovereign (Lt. Tower)	A. T. Whiston, W. Fagg
St. Gowan	S. R. Woolnough, —. Goddard
Seven Stones	T. G. Northcott, P. Hocking
Shipwash	R. Cadman, W. F. Dalby
Smith's Knoll	F. Harrison, B. H. Holmes
South Rock	D. Hawkins, J. Roche
Tongue	J. H. Wilson, H. W. Brasted
Varne	H. Scoats, F. Betts

'Marid' Ships

The following is a list of ships recruited for the observing and reporting of sea temperatures from coastal waters around Great Britain. Captains are requested to point out any errors or omissions in the list.

Name of Vessel	Master	Owner/Manager
Arco Scheldt	D. W. Best	A.R.C. (Marine) Ltd.
Anglezark	J. C. Whittaker	Effluent Services Ltd.
Ashington	J. Buckham	Stephenson Clarke Shipping Ltd.
Avalon	R. Wild	British Rail
Bardic Ferry	C. K. Hughey	Atlantic S.N. Co. Ltd.
Brenda	—. Dias	Dept. of Agriculture & Fisheries for Scotland
Brian Boroime	C. B. Powell	British Rail
British Osprey	T. J. Taylor	B.P. Tanker Co. Ltd.
Cæsarea	P. Baker	British Rail
Caledonian Princess	M. Hurd-Wood	British Rail
Cerdic Ferry	A. D. Young	Atlantic S.N. Co. Ltd.
Clansman	D. Gunn	David MacBrayne Ltd.
Claymore	C. McKenzie	David MacBrayne Ltd.
Columba	A. C. Free	David MacBrayne Ltd.
Corbank	J. Johnston	Ocean Transport & Trading Ltd.
Doric Ferry	R. Hockings	Atlantic S.N. Co. Ltd.
Dorset Coast	R. G. Clare	P. & O. Short Sea Shipping Ltd.
Dragon	W. H. Conway	Southern Ferries Ltd.
Esso Fawley	F. W. Dogherty	Esso Petroleum Co. Ltd.
Esso Mersey	P. H. Mattocks	Esso Petroleum Co. Ltd.
Esso Milford Haven	W. Lowdes	Esso Petroleum Co. Ltd.
Ferryhill II	J. G. Innes	Aberdeen Coal & Shipping Co. Ltd.
Fingal	F. Davidson	Northern Lighthouse Board
Frendo Hope	L. Bowler	Frendo (London) Ltd.
Frendo Pride	J. D. Gore	Frendo (London) Ltd.
Frendo Star	D. J. Hyslop	Frendo (London) Ltd.
Hamble	A. Kerr	Shell-Mex & B.P. Ltd.
Hebrides	J. Hodgson	David MacBrayne Ltd.
Helmsdale	A. F. Ross	Northern Trading Co. Ltd.
Hibernia	J. Peters	British Rail
Inganess Bay	A. J. Soulsbury	Elwick Bay Shipping Co. Ltd.
Lairdsfox	N. Campbell	Belfast S.S. Co. Ltd.
Loch Carron	J. McKinnon	David MacBrayne Ltd.
Malling	T. Bone	Stephenson Clarke Shipping Ltd.
Moyle	W. Davey	Shamrock Shipping Co. Ltd.
Navigator	J. N. Cannock	Decca Navigator Co. Ltd.
Penelope Everard	H. Wadhams	F. T. Everard Ltd.
Pharos	M. Fraser	Northern Lighthouse Board
Pole Star	G. Reid	Northern Lighthouse Board
Portelet	J. G. McFail	Onesimus Dorey Ltd.
Rhodri Mawr		British Rail
Ringnes	J. F. Neubauer	Jebsen (U.K.) Ltd.
Rosemarkie	S. R. Gurton	W. N. Lindsay & Co. Ltd.
St. Clair	D. C. Gray	North of Scotland Shipping Co. Ltd.
St. Edmund	D. Wild	British Rail
St. George	A. Wood	British Rail
Sarnia	J. Davies	British Rail
Slieve Donard	R. Crane	British Rail
Somersetbrook	B. Estill	Comben Longstaff & Co. Ltd.
Sussexbrook	J. Minards	Comben Longstaff & Co. Ltd.
Ulster Queen	P. Lynch	Belfast S.S. Co. Ltd.

BRITISH COMMONWEALTH

The following lists give the name of Selected and Supplementary Ships, and the number of Auxiliary Ships where known (i.e., those which only report when in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth.

Information for these lists is required by 10th April each year. Information for the January corrective lists is required by 10th October each year.

NEW ZEALAND (Information dated 1.3.76)

NAME OF VESSEL	OWNER/MANAGER
Selected Ships:	
Act 3	Blue Star Port Line Ltd.
Act 4	Blue Star Port Line Ltd.
Act 5	Blue Star Port Line Ltd.
Athel Viscount	Union S.S. Co. N.Z. Ltd.
Atlas	Brown & Root International Ltd.
Bulknes	Shipping Corporation of N.Z.
Coastal Trader	Shipping Corporation of N.Z.
Erne	Union S.S. Co. N.Z. Ltd.
Glomar Tasman	Bocal Pty Ltd.
Hawea	Union S.S. Co. N.Z. Ltd.
Holmdale	Union S.S. Co. N.Z. Ltd.
James Cook	N.Z. Government (Fisheries)
John Wilson	Tarakohe Shipping Co. Ltd.
Karepo	Union S.S. Co. N.Z. Ltd.
Karetu	Union S.S. Co. N.Z. Ltd.
Kotuku	Union S.S. Co. N.Z. Ltd.
Kuaka	Union S.S. Co. N.Z. Ltd.
La Bonita	Reef Shipping Co.
Ligar Bay	Tarakohe Shipping Co. Ltd.
Lorena	Shipping Corporation of N.Z.
Luhesand	Omega Shipping Co.
Maheno	Union S.S. Co. N.Z. Ltd.
Marama	Union S.S. Co. N.Z. Ltd.
Milburn Carrier	N.Z. Cement Holdings Ltd.
N.Z. Aorangi	Shipping Corporation of N.Z.
N.Z. Waitangi	Shipping Corporation of N.Z.
Ngahere	Union S.S. Co. N.Z. Ltd.
Ngakuta	Union S.S. Co. N.Z. Ltd.
Ngapara	Union S.S. Co. N.Z. Ltd.
Penrod 74	Hunt International Petroleum Co.
Rangatira	Union S.S. Co. N.Z. Ltd.
Titoki	Anchor-Dorman Ltd.
Toamoana	Shipping Corporation of N.Z.
Totara	Anchor-Dorman Ltd.
Union Aotearoa	Maritime Carriers Ltd.
Union Auckland	Union S.S. Co. N.Z. Ltd.
Union Australia	Maritime Carriers Ltd.
Union Melbourne	Union S.S. Co. N.Z. Ltd.
Union New Zealand	Maritime Carriers Ltd.
Union South Pacific	Union S.S. Co. N.Z. Ltd.
Union Sydney	Union S.S. Co. N.Z. Ltd.
Union Trans Tasman	Maritime Carriers Ltd.
Valetta	British Phosphate Commissioners
Woosung	China Navigation Co. Ltd.
Supplementary Ships:	
Arahanga	N.Z. Railways Department
Aramoana	N.Z. Railways Department
Aranui	N.Z. Railways Department
Aratika	N.Z. Railways Department
Strath Loyal	P. & O. (N.Z.) Ltd.

Auxiliary Ships:

New Zealand also has a fleet of 9 Auxiliary Ships currently reporting.

HONG KONG (Information dated 11.3.76)

Name of Vessel	Master	Observing Officers	Senior Radio Officer	Owner/Manager
American Main	S. L. Tabanao	D. R. Sta. Maria, M. Q. Lapitan, V. O. Oqvindo	L. G. Taguinota	United States Lines
American Ming	C. Mendoza	C. C. Espino, T. C. Aying, C. G. Madera	J. T. Gran	United States Lines
American Mist	F. C. Carlos	M. Q. Bontia, P. C. Campana, G. A. Espiritu	R. M. Benoman	United States Lines
Cape St. Mary	H. M. Chan	Y. S. Kwok, M. S. Ngan, K. K. Lau	Li Kim-hung	Agriculture & Fisheries Dept. H.K. Govt.
Cardross	Cheung Hi Loi	Sung Yim Wing, Cheung Wan Wah, Chan Hung	Leung Ki On	Kian Hin Leong Enterprises Ltd.
Carl Offersen	A. J. Andresen	U. W. Biel, S. Nissen, P. H. Langelund	J. Jorgensen	Jebson & Co. Ltd.
Chengtu	A. J. Gregg	R. P. Fairbrother, D. I. Stobie, R. Daniel	T. S. Ho	China Navigation Co. Ltd.
Coral Princess	D. A. Hutchinson	D. W. Fellowes, R. S. Rawlings, M. R. Stanton, B. W. Burton	Z. Marr	China Navigation Co. Ltd.
Cree	P. J. Sullivan	Wan Hak Chung, A. C. W. Durham, A. L. Crosthwaite	Wong Kam Tong	Indo-China S.N. Co. (H.K.) Ltd.
Eastern Oak	Hu Ji-Sea	Lin Ning-Sheung, Chen Hang-Hsun, Chu Hsiao-Tung, Chau Kuo-Min	R. A. Arcinas	Oak Steamship Co. Ltd.
Eriskay	A. L. Carter	J. S. MacLeod, D. C. Clark, J. A. J. Briggs	J. J. Stone	China Navigation Co Ltd.
Foh Kim	R. F. Eckersall	A. F. M. H. Bhuiyan, S. P. A. Ali	Chiu Ying Kit	Hong Kong Borneo Shipping Co. Ltd.
Halldis	E. F. Andreassen	D. Vesteras, T. Noren, E. Lone	Wong Chiu Man	Thoresen & Co. Ltd.
Hallvard	O. Schibsted	P. Tolgensbakk, G. Larsen, K. Egeberg	Lai Kwong Yin	Thoresen & Co. Ltd.
Hoi Kung	L. Moen	S. Gulbrandsen, K. Nesheim, K. Tindeland	J. Flatebo	Karsten Larssen & Co. (H.K.) Ltd.
Hupeh	J. M. K. Kelly	D. Williams, Chen Yu Chi, D. G. Morgan	Y. C. Ma	China Navigation Co. Ltd.
Kim Seng	R. V. Pope	Hsing Nan Yen, M. M. E. H. Chowhury, Lau Chuen Sing	Sun Yun Wing	Guan Guan Shipping (PTE) Ltd.
Kwangtung	B. Keeble	F. J. Thorogood, W. P. Robinson, D. J. Bremner	S. M. Yue	China Navigation Co. Ltd.
Manoloeverett	A. Roxas	S. Flores, I. G. Daco, A. Marquez	R. Pablete	Everett S.S. Corporation S/A
Oriental Mariner	C. J. Farren	Li Yiu Mang, Tang Dock Wah, To Man Kwong, Chang An Kuo	Leung Chee Yung	Island Navigation Corporation Ltd.
Pabloeverett	C. G. Villanueva	J. Q. Estalani, M. R. Rafanan, R. Zarate	A Caminong	Everett S.S. Corporation S/A
Pampa Argentina	A. D. Ibarra	H. G. Alberro, A. J. Sabate, J. V. Martedi	L. Bonilla	Everett S'S. Corporation S/A
Patagonia Argentina				Everett S.S. Corporation S/A
Poyang	R. Kennett	C. J. Walford, D. B. Cooper, K. Ienraoi	S. Ali	China Navigation Co. Ltd.
Shansi	C. J. Coy	K. R. Strudwick, M. J. Phillips, Hung Shung Leung	M. T. Yau	China Navigation Co. Ltd.
Sinkiang	R. J. Shipp	C. H. Grainger, So Ying Kit, Yeung Man Chor	K. C. Ho	China Navigation Co. Ltd.
Soochow	J. M. Parker	R. Goodwin, Siu Wai Lim, K. R. Hawkins	C. T. Li	China Navigation Co. Ltd.
Star Aldebaran	H. B. Lundin	N. J. Augrell, A. Magnusson, J. P. Hellroth	S.I. Jonsson	Everett S.S. Corporation S/A
Star Altair	I. Westerholm	K. Valkre, H. O. Lahde, P. O. Samuelsson	T. B. Ruden	Everett S.S. Corporation S/A
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